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U.S. Delegation to the  
International Sanitary...

Report of the delegation  
from the United States...

Washington

1920

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Report of the  
Delegation from the United States of America

to the

Sixth International Sanitary Conference

At Montevideo, December 12-20

1920



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**REPORT OF DRS. J. H. WHITE AND GREGORIO M.  
GUITERAS, DELEGATES FROM THE UNITED STATES  
OF AMERICA.**

The delegation from the United States of America to the Sixth International Sanitary Conference submitted the following reports in accordance with the provisions of the program of the conference:

**I. SANITARY LAWS, ORDINANCES, AND REGULATIONS  
IMPOSED SINCE THE FIFTH CONFERENCE.**

**SANITARY LEGISLATION IN THE UNITED STATES.**

**NATIONAL.**

Since the meeting of the Fifth International Sanitary Conference in November, 1911, a number of important Federal laws having sanitary significance have been enacted in the United States. These may be briefly enumerated as follows:

The establishment of the Children's Bureau was authorized by Congress on April 9, 1912. Authority is conferred on this bureau of the Department of Labor to investigate all matters pertaining to the welfare of children.

On the same date was passed the Esch law providing for a prohibitive tax upon the manufacture of white phosphorous matches. This has resulted in the elimination in the match industry of "phossy jaw."

The Public Health Service was specially authorized on August 14, 1912, "to study the diseases of man and the conditions influencing the propagation and spread thereof, including sanitation and sewage and the pollution either directly or indirectly of the navigable streams and lakes of the United States."

On August 24, 1912, the sum of \$10,000 was appropriated to enable the United States Public Health Service to make a thorough examination as to the prevalence of tuberculosis, trachoma, smallpox, and other contagious and infectious diseases among the Indians of the United States.

An amendment of February 25, 1913, to the act creating the Bureau of Mines (May 16, 1910) authorized the preparation, treat-

ment, and utilization of mineral substances with a view to improving health conditions and increasing safety, efficiency, economic development, and conserving resources through the prevention of waste, etc.

A later act provides for the detail of Public Health Service officers for cooperative health, safety, or sanitation work with the Bureau of Mines.

The enactment of the Harrison Act on December 17, 1914, to restrict the sale and use of narcotic and habit-forming drugs was especially noteworthy from the public health standpoint.

In 1914 a law was passed providing an appropriation for special investigations of pellagra. Subsequent appropriations have been made for this purpose.

The interstate quarantine regulations for the prevention of the spread of contagious and infectious diseases in the United States were revised in January, 1916. A further revision of these regulations is being made at the present time.

To regulate the propagation and sale of biological products an appropriation was made by the sundry civil appropriation act of July 1, 1916, for the fiscal year 1917.

The child labor law entitled "An act to prevent interstate commerce in the products of child labor, and for other purposes," which was enacted September 1, 1916, has been declared unconstitutional in a State court. The Federal Administration has turned, therefore, to the taxation method of regulation, in 1919 imposing a 10 per cent tax on the net profit of concerns employing child labor.

The United States employees' compensation act of September 7, 1916, providing compensation for Federal employees suffering injuries when in the performance of their duty, is administered by the United States Employees' Compensation Commission. Under this law medical and surgical care of the beneficiaries of the commission is furnished to a great extent by the United States Public Health Service.

In the act of February 3, 1917, the Secretary of the Treasury was authorized to select and obtain a site suitable for the establishment of a home for the care and treatment of persons afflicted with leprosy, this leprosarium to be administered by the Public Health Service.

Congress gave legal recognition to the need for controlling venereal diseases in the United States by enacting legislation in the Army appropriation act of July 9, 1918, known as the Chamberlain-Kahn Act, which created in the Public Health Service a Division of Venereal Diseases, appropriating for the purpose of the act \$1,200,000 for the control of these diseases in cooperation with State boards or departments of health.

The immigration law of February 5, 1917, is of interest because of its inclusion of a requirement for the medical examination of all alien seamen and its provision for the medical examination of aliens by not less than two medical officers. The regulations governing the medical inspection of aliens were also revised in 1917 to conform to the act of February 5.

Congress established in July, 1918, in the Department of Labor a new division called the Women's Bureau, for the purpose of investigating and reporting to the department all matters pertaining to the welfare of women in industry.

Demonstrations in rural sanitation upon a cooperative plan were made possible by a special appropriation from Congress during the fiscal year 1918. The expenditures of the Government are met by at least an equal amount of funds furnished from State and local sources.

Congress appropriated \$1,000,000 on October 1, 1918, to enable the United States Public Health Service to combat and suppress Spanish influenza and other communicable diseases by aiding State and local boards of health.

Joint resolution approved October 27, 1918, creating a reserve corps in the Public Health Service for duty in time of national emergency marked a long step forward in public-health administration. Under the provisions of this act it has been possible to expand the commissioned corps and obtain sufficient personnel to efficiently operate the hospitals and sanatoria provided for the greatly increased number of beneficiaries of the service.

A sum of \$250,000 was granted by Congress October 30, 1918, for the construction of a much-needed addition to the Hygienic Laboratory of the United States Public Health Service.

The Public Health Service was designated by Congress in the act of March 3, 1919, as the medical agency of the Government through which beneficiaries of the war-risk insurance were to be given the necessary hospital and sanatoria treatment.

The promotion of vocational rehabilitation of persons disabled in industry or otherwise has been provided for by act of June 2, 1920. One million dollars annually was appropriated on the condition that for each dollar of Federal money expended there should be expended by the States an equal amount.

In the acts passed by the Congresses making appropriations for sundry civil expenses of the Government, trachoma, infantile paralysis, and influenza were included in those parts of the acts relating to the prevention of epidemics in the year 1914, 1918, and 1919, respectively.

Regulations for the control of arspenamine, neoarsphenamine, and similar drugs were promulgated in June, 1920, by a board com-

posed of the Surgeons General of the Army, Navy, and Public Health Service, and approved by the Secretary of the Treasury. In these regulations standards are prescribed for toxicity and arsenic content of arsphenamine and its substitutes. Government supervision of the manufacture and importation of these products is of great importance in connection with the campaign against venereal diseases.

Several acts or amendments have related to food sanitation:

The pure food and drugs act of June 30, 1906, was strengthened by the Sherley amendment of August 23, 1912, which declared any drug misbranded that carries any false or fraudulent statement regarding its therapeutic effects.

The act of March 3, 1913, provided for the control and eradication of hog cholera.

An act of March 4, 1913, made connecting common carriers which transport cattle originating in a quarantined area amenable to prosecution as well as the carriers which receive the cattle within the quarantined area for transportation.

At the same time legislation was enacted which made reference to the manufacture and importation of veterinary biological products.

A law relative to the importation of meat and meat food products not intended for the personal use of the consignee was passed October 3, 1913.

The importation into the United States below the southern cattle quarantine line of tick-infested cattle from Mexico, South and Central America, the islands of the Gulf of Mexico, and the Caribbean Sea for immediate slaughter was made possible by the passage of the act of August 10, 1917.

An amendment of July 24, 1917, to the meat-inspection act of June 30, 1906, provided for the inspection of equine meat for interstate and foreign movement. On October 1, 1918, a law was passed which provided for the investigation of bovine tuberculosis and for its control and eradication. Provision for the indemnification of owners of reacting cattle was included in this act.

#### STATE SANITARY LEGISLATION.

##### COMMUNICABLE DISEASES.

*In general.*—Many laws and regulations for the reporting and control of communicable diseases have been enacted and adopted since the last conference. Additions and changes are being constantly made with the objects of securing better and more complete morbidity returns and of more effectively controlling communicable diseases.

*Model law for morbidity reports.*—The Eleventh Annual Conference of State and Territorial Health Authorities with the United States Public Health Service, held in June, 1913, adopted a model law for the reporting of cases of communicable diseases. At the conference held in 1915 this model law was amended in certain particulars. The essential provisions of this law have been incorporated in the State board of health regulations of Florida, Kansas, New Jersey, Ohio, and West Virginia. The city of Spokane, Wash., has adopted most of the law as an ordinance.

*Sanitary codes.*—Some of the States have adopted very comprehensive rules and regulations for the prevention and control of communicable diseases. Connecticut, New Jersey, New York, Oregon, and Washington are among these States. The regulations adopted by the public health council of Connecticut may be taken as typical of the provisions governing communicable diseases found in the various State sanitary codes, and a brief abstract of those regulations is given herewith.

*Connecticut regulations.*—Certain words and terms used in the code such as "carriers," "isolation," "disinfection," etc., are defined at length. The diseases which are declared communicable, and therefore reportable, are enumerated. Physicians or other professional attendants are required to report cases of communicable diseases to the local health officer or other health authority within a specified time, and there are detailed provisions requiring reports from institutions, parents or householders, school-teachers, proprietors of hotels or boarding houses, nurses, persons in charge of camps, masters of vessels, and persons in charge of dairy farms. The incubation periods and minimum periods of communicability of the common communicable diseases are given. Regular daily and monthly reports by local health officers to the State department of health are required, and special reports by telephone or telegraph must be made on the occurrence of unusual diseases. Upon receiving a report of a case of communicable disease the health officer is required to institute certain control measures, and these measures, such as placarding, quarantine, and isolation, are given in detail for the different diseases. Hospitalization of affected persons, carriers, or contacts is provided for when isolation or quarantine can not otherwise be maintained. In the case of milk or water-borne diseases the use of milk and water containers is restricted, and empty containers may not be returned to the distributor until the termination of the disease or the removal of the patient; the movements of food handlers are also regulated when living where communicable diseases likely to be spread by food exist. Concurrent and terminal disinfection and cleansing are provided for. Measures for the control of diseases in schools are outlined, and other measures, such as observance of quarantine, invasion of quarantined

areas, needless exposure, etc., for the control of diseases generally, are given. Special methods are provided for the control of tuberculosis and venereal-disease cases. Laboratory findings may be required, and laboratories are required to register annually with the State department of health. Laboratories which meet with the approval of the State department of health after inspection are designated as approved laboratories. Positive laboratory findings are required to be reported to the local health officer of the place from which the specimen or culture was obtained. It is made the duty of druggists and other persons who sell or distribute diphtheria antitoxin or anti-meningitic serum to record such transactions and make reports of the same to the local health officer within a specified time. Provision is made for furnishing medical treatment, food, and other necessities to needy quarantined persons. Undertakers are required to report deaths from communicable diseases to the local health officer within a specified time, and special rules govern funerals of those dead of certain communicable diseases. When an unusual or rare disease occurs, or when a disease is so prevalent as to endanger the whole State, the State health department takes charge of the situation.

*Influenza.*—Prior to the influenza epidemic of 1918, influenza was not a reportable disease. Since then, however, it has very generally been made reportable, and in many cases detailed regulations governing it have been adopted.

*Poliomyelitis.*—The epidemic of poliomyelitis in the summer of 1916 caused several States to promulgate special regulations looking to the control of the disease.

#### TUBERCULOSIS.

The long list of laws and regulations for the control and prevention of tuberculosis is constantly increasing. The legislation relating to tuberculosis may be divided broadly into two classes—that requiring the reporting of cases and controlling the patient in his home, and that relative to the construction and maintenance of sanatoriums.

*Illinois regulations.*—The regulations adopted by the Illinois State Department of Public Health furnish a good example of the first class of tuberculosis legislation. These regulations require reports of known or suspected cases of pulmonary tuberculosis by physicians, attendants, parents, householders, or others having knowledge to the local health authorities. The attending physician must instruct the patient and members of the household as to the nature of the disease and as to the means of avoiding infection, such as proper disposal of sputum, control of cough, etc. It is made the duty of the health officer to inspect the home of the patient to satisfy himself that proper precautions are being taken for the protection

of the public and of the other members of the household. Specimens of sputum must be submitted to the health officer from time to time to determine whether or not the case is an "open" one. The term "open case" applies to cases showing active evidence of the disease, to those who have persistent cough and who produce sputum containing tubercle bacilli, and it is stated that all cases shall be regarded as "open cases" until three successive specimens of sputum, collected within three weeks, shall have been found to contain no tubercle bacilli. Certain precautions to be observed by the patient relative to sleeping alone, disposal of sputum, spitting, and coughing are outlined. Restrictions are imposed upon the sale of milk and foodstuffs from premises where there is a case of tuberculosis, and also "open cases" are prohibited from handling or preparing milk or foodstuffs. No person suffering from open tuberculosis is permitted to be employed in or about a school building, and no infected pupil is permitted to attend school. Infected persons are prohibited from nursing, attending, or caring for young children or sick persons. Upon the death or removal of an infected person the owner or agent of the premises must notify the local health officials, and the premises must not be occupied by persons other than the family or household of the patient until they have been disinfected. The method of disinfection consists of airing the rooms thoroughly, scrubbing the woodwork and cleaning the walls, and boiling the bed clothing or immersing it in an approved disinfectant. Burning of grossly soiled articles is advocated when they can not be disinfected by the usual methods.

*Sanatoriums.*—The statutes providing for the establishment and maintenance of county or district tuberculosis hospitals are, in the main, very similar. They either authorize the establishment of a hospital by the county or leave the question of such establishment to be decided by the voters of the county. Provision is made for acquiring land and erecting the necessary buildings and for the appointment of a board of managers for the hospital with certain specified duties. The board of managers appoint a superintendent of the hospital, who is the chief executive officer. Then follow detailed provisions relative to the admission of patients and their care and maintenance. It is sometimes provided that two or more counties may join in the establishment of a hospital.

#### HEALTH ORGANIZATION.

*In general.*—The statutes creating and regulating State boards of health have undergone many changes. In many States new bureaus and divisions have been added to the State health organizations, especially for child hygiene and venereal disease work.

*State departments of health.*—The greatest change in health administration has been in those States which have abolished the board of health and created a department of health. This change has been effected in Connecticut, Illinois, Maine, Massachusetts, Michigan, Nebraska, New Jersey, New York, and West Virginia, and the laws are more or less similar. A general outline of the Massachusetts act will serve to show what is accomplished by these various statutes.

*Massachusetts act.*—A State department of health is created, and it is empowered to exercise all the powers and perform all the duties of the State board of health. The department consists of a commissioner of health and a public health council, and provision is made for directors of divisions, district health officers, and other employees. The governor, with the advice and consent of his council, appoints the commissioner of health, and the latter must be "a physician skilled in sanitary science and experienced in public health administration." The term of office of the commissioner is five years, and he is required to devote his entire time to his official duties. The commissioner is the administrative head of the department of health, and his duties are to administer the health laws and regulations, to prepare regulations for the consideration of the public health council, to appoint directors of divisions and other employees and fix their compensation, make annual recommendations regarding health legislation, and perform all executive duties required of the State board of health, and other duties incident to his position.

The public health council consists of the commissioner of health and six members (at least three of them physicians) appointed by the governor, with the advice and consent of his council. The term of office of a member is three years. The public health council is required to meet at least once in each month, and the members receive \$10 a day while in conference and their necessary traveling expenses. The council has no administrative or executive functions, but it makes and promulgates regulations, takes evidence in appeals, considers plans and appointments required by law, holds hearings, makes an annual report (which includes recommendations as to health legislation) to the legislature through the governor, and discharges other duties required by law.

The commissioner, with the approval of the public health council, determines what divisions there shall be in the department of health, prescribes the duties of such divisions, and appoints and removes the directors of divisions. The compensation of directors is fixed by the commissioner within certain limitations.

Provision is made for dividing the State into eight health districts, each district to be in charge of a district health officer. Such district health officers are appointed and removed by the commissioner,

with the approval of the public health council, and are required to perform such duties as may be prescribed by the commissioner. The district health officers must be graduate physicians admitted to practice in the State or have had at least five years' experience in public health duties and sanitary science.

#### MILK AND FOODSTUFFS.

*Milk.*—The assurance of a pure milk supply has been the purpose of much legislation. The laws and regulations cover all phases of the production, distribution, and sale of milk, and enumerate in detail the various sanitary requirements. The legislation on the subject requires that the cows shall be kept in sanitary surroundings, the milk house or room shall not be near contaminating sources, the containers and utensils shall be properly cleaned and protected, the milkers shall be clean and free from communicable disease, and that all buildings and premises where milk is produced or handled must be free of filth and kept in good sanitary condition. The requirement that dairy cattle be tuberculin tested is becoming very general, as is also the requirement of pasteurization of certain grades of milk.

*Foodstuffs.*—Foodstuffs has also been the subject of much legislation. Laws prohibiting the adulteration and misbranding of food have been passed and old laws amended. Measures have been adopted for the protection of food from dust and flies, and the sale of unwholesome food has been prohibited and its condemnation provided for.

#### COMMON DRINKING CUPS, COMMON TOWELS, AND SPITTING.

Practically all States now have laws or regulations prohibiting spitting and the use of common drinking cups and common towels in public places. The definitions of a "public place" vary, but most laws and regulations prohibit spitting or the use of common drinking cups and towels in public buildings, hotels, theaters, schools, boats, railroad cars, and railroad stations.

#### HABIT-FORMING DRUGS.

Very full and complete statutes have been enacted in many States for the regulation of the possession, sale, and dispensing of habit-forming drugs. In addition there have been numerous amendments to existing statutes. The following States have passed comprehensive laws on the subject of narcotics: Colorado, Connecticut, Delaware, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New York, North Dakota, Pennsylvania, Rhode Island, Tennessee, Utah, and Vermont.

## BIRTHS AND DEATHS.

The registration of births and deaths has been extended, and the model law advocated by the United States Bureau of the Census, or a modification of such model law, has been passed in several States. Very briefly, this standard system of registration provides that the State board of department of health has charge of the registration of births and deaths; a bureau of vital statistics is established and a State registrar of vital statistics designated; the State is divided into primary registration districts, with a local registrar of vital statistics for each district; the issuance of permits for the burial or removal of dead bodies is regulated; certificates are required from physicians, midwives, etc., attendant upon the birth or death; the items which the birth and death certificates shall contain are listed; special provision is made for death occurring without medical attendance; persons who sell caskets at retail must make a monthly report of all sales, showing the name and address of the purchaser, name of deceased, etc.; birth and death certificates are filed with the local registrar, and he is required to make copies of them and send the originals to the State registrar.

## MARRIAGE OF DISEASED PERSONS.

The following is a brief summary of the requirement in those States which have laws governing the marriage of persons with communicable diseases.

*Alabama.*—A physician's certificate regarding freedom from venereal disease is required from a male applicant for a marriage license.

*Indiana.*—No license shall be issued when either party is afflicted with a transmissible disease.

*Maine.*—Marriage of a person having syphilis is prohibited until he has a certificate from the attending physician or physicians that such person is cured.

*Michigan.*—Persons who have been afflicted with syphilis or gonorrhea and who have not been cured are not capable of contracting marriage.

*New Jersey.*—It is unlawful for venereally infected persons to marry.

*New York.*—Each party must make affidavit as follows:

I have not to my knowledge been infected with any venereal disease, but, if I have been so infected within five years, I have had a laboratory test within that period which shows that I am now free from infection from any such disease.

*North Dakota.*—Each party is required to file an affidavit of at least one physician, other than the person seeking the license, showing that the parties are not afflicted with pulmonary tuberculosis in

its advanced stages. An affidavit of the male must also show that he has no contagious venereal disease.

*Oklahoma.*—It is a felony for a person infected with a venereal disease to marry before being discharged and pronounced cured, in writing, by a reputable physician.

*Oregon.*—A male applicant must file a certificate from a physician licensed to practice within the State, made under oath within the preceding 10 days, showing that he is not afflicted with any contagious venereal disease.

*Pennsylvania.*—Application must show that neither of the parties is afflicted with a transmissible disease.

*Utah.*—Marriage with a person afflicted with syphilis or gonorrhea which is uncured is forbidden.

*Vermont.*—A person who has been told by a physician that he or she is afflicted with gonorrhea or syphilis is forbidden to marry without assurance or certification from a legally qualified practitioner of medicine or surgery that he or she is free from such disease.

*Virginia.*—A license is not issued to any person who is afflicted with a contagious venereal disease. The person who issues the license may accept the affidavit of the male that he is free from any contagious venereal disease and that he believes the woman to be free therefrom.

*Washington.*—An affidavit is required from each applicant showing that the applicant is not afflicted with pulmonary tuberculosis in its advanced stage. The affidavit of the male must also show that he is not afflicted with a contagious venereal disease.

*Wisconsin.*—Within 15 days prior to the application the male applicant must be examined for venereal disease by a physician licensed to practice in Wisconsin or in the State where the applicant resides. The applicant must file the physician's certificate showing that he is free from venereal disease. Any person who has had gonorrhea or syphilis must file a certificate from a designated State laboratory showing that such person no longer has the disease in a communicable state.

## INDUSTRIAL HYGIENE.

## OCCUPATIONAL DISEASES, ETC.

Fifteen States, namely, California, Connecticut, Illinois, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Rhode Island, and Wisconsin, provided legislation during the years 1911 and 1915 requiring that report be made by physicians of certain cases of occupational diseases coming to their attention, reports to be made either to the State board of health, commissioner of bureau of labor and statistics,

State board of labor and industries, or commissioner of labor, as the case may be.

Departments or divisions of industrial hygiene are maintained by the States of Pennsylvania, New York, New Jersey, Ohio, Illinois, and Massachusetts either through the department of labor, State board of health, or bureau of labor and industries, as the case may be.

In the case of Pennsylvania legislation in 1913 provided for a department of labor and industry; one of three divisions established was a bureau of sanitation, and a division of industrial hygiene was established providing for a chief medical inspector, a chemical engineer, a mechanical engineer who was an expert in ventilation and accident prevention, and a civil engineer who was an expert in fire prevention and building construction. Legislation was also enacted in 1913 relative to regulations in the case of dangerous occupations and requiring monthly medical examinations; in regard to lighting, ventilation, protective devices against dust and fumes, and also personal-service facilities.

In the case of New York legislation was made in 1913 for the appointment of an industrial board and provision made for the establishment of a division of industrial hygiene, same to be under the direction and supervision of a commissioner of labor and providing for one chief medical inspector, a chemical engineer, a mechanical engineer who was an expert in ventilation and accident prevention, and a civil engineer who was an expert in fire prevention and building construction. A bureau of statistics and information was established comprising five divisions, one of which was the division of industrial accidents and diseases, the object being to collect and prepare statistical details and general information relative industrial accidents and occupational diseases, their causes and effects, methods of preventing, curing, and remedying same and of providing compensation therefor. Provision was made for reporting by physicians to the commissioner of labor of occupational diseases coming to their attention, including poisoning by lead, phosphorus, arsenic, brass, wood, alcohol, mercury, or their compounds, or from anthrax, compressed-air illness, etc.

In 1912 the State of New Jersey made provision whereby physicians were required to report to the State board of health all occupational diseases coming to their attention, and enforcement of the provisions of the act relative to occupational diseases made to rest with the State board of health.

In 1911 the State of Massachusetts made provision for the investigation by State inspectors of health when inspecting factories and workshops and other industrial establishments relative to proper lighting conditions, concerning the eye and vision in their relation to occupational diseases, including injuries to the eye, pathologically

produced or prompted by circumstances under which the various occupations are carried on and also providing for the installation of mechanical devices, etc., for the prevention or reduction of eye injuries. In 1913 enactment was also made whereby suitable safety devices or other means for prevention of accidents shall be adopted and determination made as to requirements for the prevention of industrial or occupational diseases.

The State of Ohio provided legislation whereby physicians were required to report to the State board of health all cases of occupational diseases coming to their attention and also preventive methods in regard to the sanitation of factories requiring employers to provide effective devices, means, and methods for the prevention of contraction by employees of illnesses or diseases incident to the work. Legislation was provided whereby employers were required to provide protective devices against exposure of employees to lead dusts, fumes, or solutions.

The State of Illinois made provision in 1911 whereby physicians are required to make report to the State board of health all cases of industrial or occupational diseases or illnesses, or diseases or illnesses due or incident to the character of the work in which the employees are engaged. Certain stringent regulations relative to employees engaged in the lead trades were provided for and employers required to maintain certain standards relative to sanitary conditions for the employees.

The States of Colorado, Illinois, Nevada, New York, North Dakota, Ohio, Oklahoma, Utah, Virginia, and Wisconsin have provided legislation for the establishment of industrial commissions; the States of Indiana and Pennsylvania have provided for industrial boards; the States of Delaware, Idaho, Massachusetts, Michigan, Montana, and Texas have provided legislation for establishment of industrial accident boards (the Territory of Hawaii has provided similar legislation); the States of California, Kansas, Oregon, and Washington provide for industrial welfare commissions, while California, Maine, Maryland, and Oregon provide legislation for industrial accident commissions. In several other States, although legislation does not provide for industrial commissions or boards, authority in this connection is vested in the bureau or department of labor, as the case may be, such as New Jersey, etc.

New Jersey and Pennsylvania provide for absolute exclusion of women from handling any dry substance or compound containing more than 2 per cent of lead.

New York and Ohio prohibit women from operating certain kinds of emery and other polishing wheels. Night work by women between the hours of 9 or 10 p. m. and 6 a. m. in some or all occupations

is prohibited in the States of Connecticut, Delaware, Indiana, Kansas, Massachusetts, Nebraska, New York, Pennsylvania, South Carolina, and Wisconsin.

Legislation is provided by the States of Connecticut, Vermont, Massachusetts, and New York prohibiting employment of women after childbirth in carrying, hauling, or pushing weights; Connecticut, Vermont, and Massachusetts prohibit employment of women before childbirth.

Forty-five States established by statute an age minimum of 14 or higher for employment in factories, etc.; one State, namely, Montana, having set the minimum at 16.

The States of Arizona, Missouri, Nevada, New York, Oklahoma, and Tennessee have provided legislation prohibiting persons under 16 from employment in manufacturing, dipping, drying, and packing of matches, preparation of phosphorus, etc.; Pennsylvania, Maryland, Massachusetts, Ohio, and Wisconsin set a minimum age of 18; while Indiana sets a minimum age of 16 for boys and 18 for girls.

The States of Alabama, Arizona, California, Colorado, Connecticut, Florida, Illinois, Kentucky, Maryland, Minnesota, Missouri, New Jersey, Nevada, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, Utah, Vermont, Wisconsin, and Wyoming have provided legislation whereby persons under 16 are not permitted to be employed in the manufacture or packing of paints, colors, and white or red lead; while Delaware restricts the age to 15. The States of Alabama, Arkansas, California, Connecticut, Kentucky, Maryland, New Jersey, and Ohio prohibit employment of persons under 16 in soldering.

New Jersey prohibits the employment of persons under 16 in all processes in which lead or its compounds are used, while Pennsylvania restricts persons under 16 from employment in the preparation of compositions in which dangerous leads are used. The State of Pennsylvania further restricts persons under 21 from employment in dry packing of lead carbonate, red lead, basic sulphate of lead, or sublimated white lead.

The States of Alabama, California, Connecticut, Maryland, New Jersey, North Dakota, Oklahoma, Pennsylvania, and Wisconsin prohibit the employment of persons under 16 in the manufacture of poisonous dyes; the State of Delaware restricts the age to 15.

The States of Illinois, Missouri, New Jersey, Ohio, and Pennsylvania have detailed regulations for certain lead trades in the respective State laws. Regulations provided by these States affecting the manufacture of white lead, oxides of lead, lead chromate, lead arsenate, etc., provide for physical examinations once a month of all employees; provide for adequate measures for removal of poisonous fumes and dust; personal service facilities, as laboratories with soap, towels, etc., and shower baths; cloakrooms with separation of street

and working clothes and provisions whereby meals are not to be eaten in workrooms; to provide working clothes and respirators for dusty processes; floors to be of such construction as to permit the easy removal of dusts; floors to be washed daily. New Jersey, Ohio, and Pennsylvania provide also for workrooms to be adequately lighted and ventilated.

The States of Connecticut, Indiana, Maine, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, Pennsylvania, Tennessee, and Wisconsin have provided legislation regulating home work, while Illinois, Indiana, Maryland, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, and Tennessee have provided legislation prohibiting housework.

## II. ADOPTIONS OF THE RESOLUTIONS PASSED BY THE PRECEDING CONFERENCE.

I. The delegates sent by the American Government to previous International Sanitary Conferences have always been high-ranking officers of the Public Health Service, of many years' training and experience in sanitary measures. The practice of detailing to each conference a delegate who has attended a previous conference has also been followed. The sense of this resolution is met in the present instance by the detail of Asst. Surg. Gen. J. H. White and Senior Surg. Georgio M. Guiteras.

II. With regard to the second resolution, the war and the attending disorganization of peace-time activities have held in abeyance the carrying out of the sense of this resolution. The Public Health Service, however, indorses heartily the sentiment expressed therein, and hopes that the collection of information provided for in this resolution will be carried out actively in the future.

III. Is met by a new resolution to be presented by the American delegation.

IV. Considerable progress has been made in the organization of practical courses in hygiene and sanitation since the Fifth International Sanitary Conference. The following list of educational institutions at which such courses are given shows that there are now in existence considerable facilities whereby persons desiring to enter a public-health career may obtain the fundamental qualifications required by this work: Universities of California, Colorado, Columbia, Georgia, Iowa, Kansas, Kentucky, Missouri, Ohio, Pennsylvania, Syracuse, Texas, Tulane, Union, Wisconsin, and Yale; Chicago Hospital College of Medicine, Harvard Medical School, Johns Hopkins Medical School, University of Michigan Medical



School, New York University and Bellevue Hospital Medical College, Massachusetts Institute of Technology, and Detroit College of Medicine and Surgery.

V. With respect to resolution V, it is believed that the practices of the United States Government conform with the provisions of the Sanitary Conference of Washington.

VI. The sense of this resolution is met by the fact that all deaths which take place in the United States are required to be certified to by physicians.

VII. The provisions of this resolution are met by the operation of the pure food and drugs act. Large laboratories, maintained by Federal appropriations, are operated at the ports of entry, such as New York City, etc., for the purpose of inspecting and analyzing all foodstuffs and drinks imported, as provided for by legislation enacted by Congress.

VIII. The provisions of this resolution have been met by the enactment of legislation by Congress to establish a national leprosarium. The site of this institution has been purchased and it is thought that it will be in operation shortly after the new year. The knowledge of the distribution of leprosy in the United States at present is not complete, but as soon as the national leprosarium is in operation steps will doubtless be taken for a national leprosy survey, in order to obtain as accurately as possible a knowledge of the distribution of leprosy in the United States, where it is well known that the disease rarely occurs.

In this connection it should be stated that at the leprosy investigation station maintained by the Public Health in the Territory of Hawaii very favorable results in the treatment of leprosy have been recorded from the subcutaneous injection of the ethyl esters of the fatty acids of chaulmoogra oil, which have been prepared for the use of the service by Prof. A. L. Dean, of the University of Hawaii. By the use of this treatment about 75 lepers have been paroled since October 1, 1918. Should further experiments bear out the favorable impression of the results of this treatment it is thought that lepers will no longer hesitate to declare themselves, in order that they may be relieved of a disease so universally dreaded. As it is the intention to apply this treatment in the national leprosarium about to be operated, it is believed that the leper problem so far as the United States is concerned is in a fair way to be adequately solved.

IX. This resolution is met so far as may be by the continuing research work of the United States Public Health Service.

X. The United States Public Health Service is convinced that it is hopeless to attempt regulation of prostitution in seaports or elsewhere. Sanitary inspection of prostitutes to protect their patrons is a failure.

The Federal, State, and municipal governments in the United States are making every effort to suppress commercial prostitution. In many communities where prostitutes are arrested medical examination is made. If found infected they are isolated and treated. This is not a species of regulation, but is an incident in the repression of all prostitution. The reduced incidence of venereal diseases resulting from a policy of rigid suppression, rather than regulation, demonstrates this method to be the most scientific and efficacious.

XI. A bill introduced at the last session of Congress provided for the establishment of a tuberculosis division in the Bureau of the Public Health Service. This, to all intents and purposes, would fulfill the requirements of this resolution providing for a "Permanent commission on tuberculosis." Congress, however, has not acted on this measure. The Public Health Service in its annual estimates for appropriations has also requested sums to be spent in the further study of tuberculosis. It is hoped that some action may be forthcoming when the Congress convenes again.

In this connection it may be stated that as the Public Health Service has been made responsible for the hospital care of American ex-service men and women in the World War, the Public Health Service is making extensive provisions for the care of the tuberculous in this category, as it is expected that ultimately some 12,400 beds will be provided for the care of these patients. As the number of men and women in service was between 4,000,000 and 5,000,000 it will be seen that one-twentieth of the population of the United States has become potentially wards of the Public Health Service, so far as tuberculosis is concerned.

XII. In respect to resolution XII, it is believed that the United States Quarantine Regulations and quarantine procedure are in consonance with the Sanitary Convention of Washington, although less stringent as to some of the provisions of the existing convention, viz, elimination of detention of personnel in the prevention of the introduction of bubonic plague, bacteriological examination in lieu of an arbitrary period of detention in measures enforced to prevent the introduction of cholera.

XIII. With respect to resolution XIII, it may be stated that the quarantine officer, in all instances, appropriately advises the master of the vessel as to such sanitary rules and regulations as the ship or its personnel may be subject to.

XIV. In recent legislation affecting immigration, provision was made for detailing officers of the Public Health Service on vessels carrying immigrants to ports in the United States. Owing, however, to the objection on the part of the Powers and the intervention of the war, it has not been practicable to date to carry out this measure as provided for in legislation.

XV. With respect to resolution XV, vessels engaged in overseas traffic are encouraged to provide apparatus and other means of disinfection, and this is particularly set forth in the United States Quarantine Regulations in the section relating to "General requirements at sea."

XVI. Inasmuch as all disinfection measures are carried out at quarantine stations operated by the United States Public Health Service in this country under the direction of officers of that service skilled in quarantine procedures, the spirit of this resolution is carried out in each instance in the United States.

XVII. With respect to resolution XVII, the United States Quarantine Regulations, copies of which are supplied to agents, owners, and masters, appropriately advise as to the isolation of persons suspected of infectious disease and for their necessary observation and care.

XVIII. With regard to this resolution, the committee states that they have complied.

XIX. With respect to resolution XIX, the United States Quarantine Regulations contain appropriate provisions as to the competency of authority issuing certificate as to immunity from yellow fever.

XX. The tendency in the United States is in direction of having all city water supplies operated by the city authorities, and large numbers have been taken over by the municipalities in the past 10 years. The State and local health authorities are lending their support to the movement toward municipal water supplies. It is doubtful whether any city in the United States has a sewage disposal plant which is operated for private gain.

Sanitary engineering departments have been organized in a large proportion of the States since 1910. About 35 States have such departments at the present time, as against about 12 in 1910. These departments assist individual localities in the improvement of the quality of their water supplies. The Public Health Service co-operates by detailing sanitary engineers to certain States, whose special duty is to assist in improving the quality of water supplies furnished to interstate carriers.

XXI. That the spirit of this resolution is complied with is shown by the fact that practically all of the large seaport towns of any consequence in this country present most excellent systems of water supply and sewage disposal. This is abundantly shown by the low death rate from water-borne diseases in such seaports. For instance, the low death rate from typhoid fever in our principal seaports in 1919 is shown by the following figures:

*Deaths from typhoid fever per 100,000 population.*

New York City	2.0
Philadelphia	4.4
New Orleans	13.7
San Francisco	3.3
Boston	2.2
Baltimore	8.9
Seattle	2.3

The Public Health Service has carried on a continuous campaign for the improvement of municipal sanitation since 1913, and, as shown in this memoir, it is gratifying to note the steady decline which has taken place in the death rate from water-borne diseases. Figures for Savannah, Charleston, and Galveston not given.

XXII. The service has continued to urge the adoption of vaccination laws and regulations. During the World War the Treasury Department, on request of the Public Health Service, urged that industries engaged in the production of war materials require the vaccination of their employees against smallpox. The Public Health Service during this period also vaccinated against smallpox all persons who applied to any of its stations for this purpose.

The laws and regulations in the United States in regard to compulsory vaccination against smallpox have not been materially changed since 1911. General vaccination is made compulsory in only a few States, but a large number of States have laws or regulations requiring the vaccination of school children or vaccination of children prior to a specified age. Vaccination of the general population in case of epidemics is required in a few States.

XXIII. Precautions concerning passengers coming from cholera-infected localities have been consistently carried out by the Public Health Service in every instance. Fortunately, there has been no occasion to carry out these precautions so far as the ports of continental United States is concerned since the great cholera epidemic which raged in Europe in 1910 and 1911.

XXIV. This resolution has been complied with, as shown by the printing of this report.

XXV. Extensive studies were conducted by the Public Health Service of the outbreaks of poliomyelitis in this country during 1916, and the results of these studies are reported in publications of the service.

During the World War there was a number of cases of cerebrospinal meningitis among troops in camps and some local outbreaks of the disease which were carefully studied by the Public Health Service, especially in regard to the carrier problem. The various strains of meningococci have also been the subject of intensive re-

search and the results of this research are published as Hygienic Laboratory bulletins.

XXVI. Recommendations of previous conference on prophylactic measures against plague have been carried out so far as practicable by the Public Health Service. Elsewhere in this memoir the efficiency of these measures as applied to the recent outbreak of plague in New Orleans, Galveston, and Pensacola, as illustrated.

### III. ENUMERATION OF THE CONTAGIOUS DISEASES WHICH MAY HAVE PREVAILED SINCE THE FIFTH CONFERENCE (IN PARTICULAR INFLUENZA), MEASURES ADOPTED TO AVOID ITS PROPAGATION, NUMBER OF CASES, AND DEATHS.

#### PREVALENCE OF TRANSMISSIBLE ANTERIOR POLIOMYELITIS.

In 1916 an epidemic of transmissible anterior poliomyelitis occurred in many sections of the United States. The principal epidemic area comprised northern New Jersey, southeastern New York, and most of Connecticut, Massachusetts, and Rhode Island, the case rates in these States ranging from 0.5 to 1.4 per thousand population. Maryland, Michigan, Minnesota, Montana, and Pennsylvania had reported case rates of between 0.2 and 0.5 per thousand population. Beginning in the late spring, unusual prevalence of the disease was reported until the close of the year.

Figures for the country as a whole are not available, but the number of cases reported by 18 States from 1915 to 1919, inclusive, is shown, by months, in the accompanying table. These States comprise about 48 per cent of the population of the United States, and represent all sections. The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Oregon, Vermont, Virginia, and Wisconsin, and their population on January 1, 1920, was about 50,837,000.

In these States about 79 per cent of the cases reported during the five-year period occurred during 1916.

#### POLIOMYELITIS.

Annual case rate per 100,000 population, by months, during the 5-year period 1915 to 1919 in 18 States.

[Population Jan. 1, 1920, about 50,837,000.]

Month.	Year.					Annual average.
	1915	1916	1917	1918	1919	
January.....	1.6	1.6	2.5	1.2	1.0	1.6
February.....	1.3	1.6	1.6	1.1	.9	1.3
March.....	2.2	1.3	2.1	2.9	.6	1.8
April.....	2.1	1.7	1.7	2.2	1.0	1.8
May.....	1.1	2.8	2.7	1.4	.8	1.7
June.....	1.8	12.1	2.2	2.5	1.8	4.6
July.....	2.9	140.1	7.6	5.1	4.7	31.7
August.....	6.3	241.1	10.7	7.6	6.3	53.7
September.....	9.0	126.2	7.1	7.3	5.4	30.6
October.....	8.2	38.6	4.4	2.2	4.2	15.3
November.....	4.2	15.2	1.9	1.3	2.1	4.9
December.....	2.0	5.1	1.2	.7	1.2	2.0
Twelve months.....	3.6	50.6	4.0	3.0	2.5	12.6

Number of cases reported during the 5-year period 1915 to 1919 in 18 States.

Month.	Year.					Total.
	1915	1916	1917	1918	1919	
January.....	65	65	100	49	42	322
February.....	34	65	64	47	38	274
March.....	86	54	86	121	27	374
April.....	84	70	91	92	41	358
May.....	44	112	91	50	35	338
June.....	73	484	195	102	77	929
July.....	115	5,628	310	212	197	6,460
August.....	235	9,684	435	315	266	10,855
September.....	335	5,067	290	302	227	6,241
October.....	325	2,354	181	93	177	3,130
November.....	185	610	79	52	89	995
December.....	80	205	49	30	49	413
Total.....	1,701	24,295	1,949	1,471	1,265	30,781

Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1917, inclusive (not including soldiers, sailors, and marines).

[Figures from publications of Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	56,275,977	63.1	1,060	1.8	1915...	67,336,992	67.1	691	1.0
1912...	60,427,247	68.2	1,136	1.9	1916...	71,621,632	70.2	7,130	10.0
1913...	63,298,718	63.1	864	1.4	1917...	75,307,936	72.7	1,182	1.6
1914...	65,989,295	66.8	720	1.1					

## EPIDEMIC CEREBROSPINAL MENINGITIS.

The accompanying tables show the number of cases of cerebrospinal meningitis reported in 16 States of the United States during the 5-year period 1915 to 1919, by months, and the case rate per 100,000 population for the same States.

The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, New York, Ohio, South Carolina, Virginia, Washington, and Wisconsin. The population of these States January 1, 1920, was nearly 45,920,000, which was about 43 per cent of the population of the continental United States.

*Annual case rate per 100,000 population, by months, during the 5-year period 1915 to 1919 in 16 States.*

Month.	Year.					Annual average.
	1915	1916	1917	1918	1919	
January.....	4.3	2.5	3.2	16.3	4.6	6.2
February.....	3.8	2.7	5.4	15.5	5.1	5.5
March.....	4.3	3.8	11.1	16.3	4.7	8.1
April.....	4.5	3.7	13.8	14.2	4.8	8.2
May.....	3.5	3.4	12.2	10.2	4.0	6.7
June.....	3.5	3.9	8.5	5.9	2.6	4.9
July.....	3.0	3.4	4.9	5.1	3.4	4.0
August.....	2.2	2.8	3.2	4.8	2.6	3.1
September.....	2.3	2.0	3.1	4.1	2.3	2.8
October.....	2.5	2.5	2.9	5.0	2.9	3.2
November.....	1.6	2.2	4.2	3.4	2.8	2.9
December.....	2.5	2.2	9.4	4.0	2.8	4.2
Twelve months.....	3.2	2.9	6.8	8.7	3.6	5.1

*Number of cases reported during the 5-year period 1915 to 1919 in 16 States.*

Month.	Year.					Total.
	1915	1916	1917	1918	1919	
January.....	154	92	119	610	173	1,148
February.....	135	99	108	582	193	1,207
March.....	133	137	409	611	179	1,469
April.....	103	124	510	333	183	1,523
May.....	126	123	450	381	153	1,233
June.....	124	142	314	221	100	901
July.....	106	124	181	191	131	733
August.....	78	103	117	181	99	578
September.....	81	73	116	154	88	512
October.....	90	91	108	189	112	590
November.....	59	81	154	128	108	530
December.....	91	81	347	151	107	777
Total.....	1,300	1,289	3,023	3,952	1,626	11,221

## INFLUENZA.

In December, 1915, and January, 1916, a widespread epidemic of influenza occurred in the United States. The disease spread throughout the country with great rapidity, but the mortality was light as

compared with later epidemics. Early in September, 1918, influenza was reported at points on the Atlantic seaboard and spread rapidly over the country, the "peak" of the epidemic being reached during the latter part of October, 1918. A recrudescence of the disease occurred early in 1919. Pneumonia was a frequent complication of the disease, and many of the deaths were attributed to this cause.

Prior to this epidemic influenza was not a reportable disease in the United States, and comprehensive figures showing the number of cases are not obtainable.

Another epidemic began in January, 1920, and continued until March, reaching its "peak" during the first half of February.

*Deaths from influenza and pneumonia (all forms) combined, during 1918, in the registration area of the United States.*

[Population, 81,868,104, being about 77.8 per cent of total population of the continental United States.]

Month.	Number of deaths.	Annual death rate per 1,000 population.	Month.	Number of deaths.	Annual death rate per 1,000 population.
January.....	18,189	2.7	August.....	2,804	0.4
February.....	16,116	2.4	September.....	12,235	1.8
March.....	18,918	2.8	October.....	185,865	28.4
April.....	20,532	3.0	November.....	86,886	12.7
May.....	9,885	1.5	December.....	69,080	10.1
June.....	4,416	0.6	Twelve months.....	456,690	5.6
July.....	5,640	0.5			

In 46 cities of the United States, having an aggregate population of more than 24,400,000, the reports from December 28, 1919, to March 20, 1920, showed 38,411 deaths from influenza and pneumonia combined. The deaths, by weeks, are shown in the following table:

*Deaths from influenza and pneumonia (all forms) in certain large cities of the United States, by weeks, from Dec. 28, 1919, to Mar. 20, 1920, with death rates per 1,000 population.*

[Population 24,400,000.]

Week ended—	Number of deaths.	Annual death rate per 1,000 population.	Week ended—	Number of deaths.	Annual death rate per 1,000 population.
Jan. 3..... 1920.	956	2.0	Feb. 21..... 1920.	5,210	11.1
10.....	1,004	2.1	28.....	3,269	7.0
17.....	1,130	2.4	Mar. 6.....	2,204	4.7
24.....	2,072	4.4	13.....	1,630	3.5
31.....	4,607	10.0	20.....	1,350	2.9
Feb. 7.....	2,533	15.7	Total.....	38,411	6.8
14.....	7,547	16.1			

During 1919 the following deaths were reported:

	No.	Rate.
Pneumonia, in all forms.....	105,213	123.6
Influenza.....	84,113	98.8

Area reported upon in 1919 held 81.1 per cent of total population.

*Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).*

[Figures from publications of Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	9,294	15.7	1915...	67,336,992	67.1	10,544	15.7
1912...	60,427,247	63.2	6,237	10.3	1916...	71,621,632	70.2	10,367	14.5
1913...	63,298,718	65.1	7,725	12.2	1917...	75,307,906	72.7	12,442	16.5
1914...	65,989,295	66.8	6,014	9.1	1918...	81,808,104	77.8	11,183	13.7

### DIPHTHERIA.

The following table shows the number of cases of diphtheria reported in 21 States during the five-year period 1915 to 1919, with case rate per 100,000 population. The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Oregon, South Carolina, Vermont, Virginia, Washington, and Wisconsin. The combined population of these States January 1, 1920, was about 55,377,000, being about 52 per cent of the population of the continental United States.

Year.	Number of cases reported.	Case rate per 100,000 population.
1915.....	79,462	153
1916.....	69,848	133
1917.....	77,094	144
1918.....	62,832	116
1919.....	86,652	158
Five years.....	375,798	.....
Annual average.....	75,159	141

### DIPHTHERIA AND CROUP.

*Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).*

[Figures from Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	11,174	18.9	1915...	67,336,992	67.1	10,544	15.7
1912...	60,427,247	63.2	11,013	18.2	1916...	71,621,632	70.2	10,367	14.5
1913...	63,298,718	65.1	11,920	18.8	1917...	75,307,906	72.7	12,442	16.5
1914...	65,989,295	66.8	11,786	17.9	1918...	81,808,104	77.8	11,183	13.7

### MALARIA.

*Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).*

[Figures from Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	1,802	3.0	1915...	67,336,992	67.1	1,541	2.3
1912...	60,427,247	63.2	1,848	3.1	1916...	71,621,632	70.2	2,175	3.0
1913...	63,298,718	65.1	1,865	2.9	1917...	75,307,906	72.7	2,385	3.2
1914...	65,989,295	66.8	1,477	2.2	1918...	81,808,104	77.8	2,534	3.1

### MEASLES.

The following table shows the number of cases of measles reported in 20 States during the five-year period 1915 to 1919, with case rates per 100,000 population. The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New York, Ohio, Oregon, South Carolina, Vermont, Virginia, Washington, and Wisconsin. The combined population of these States January 1, 1920, was about 52,222,000, being about 49 per cent of the population of the continental United States.

Year.	Number of cases reported.	Case rate per 100,000 population.
1915.....	162,905	332
1916.....	306,432	616
1917.....	375,947	745
1918.....	286,837	564
1919.....	96,313	186
Five years.....	1,240,554	.....
Annual average.....	248,110	492

*Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).*

[Figures from publications of the Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	39,275,977	63.1	5,922	10.0	1915...	67,336,992	67.1	3,649	5.4
1912...	63,427,247	63.2	4,240	7.0	1916...	71,621,632	70.2	7,947	11.1
1913...	63,298,718	63.1	8,108	12.8	1917...	75,307,906	72.7	10,442	13.9
1914...	65,989,295	66.8	4,461	6.8	1918...	81,868,104	77.8	8,223	10.0

### SCARLET FEVER.

The following table shows the number of cases of scarlet fever reported in 21 States during the five-year period 1915 to 1919, with case rates per 100,000 population. The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Oregon, South Carolina, Vermont, Virginia, Wisconsin, and Washington. The combined population of these States January 1, 1920, was about 55,377,000, being about 52 per cent of the population of the continental United States.

Year.	Number of cases reported.	Case rate per 100,000 population.
1915.....	65,365	126
1916.....	64,498	122
1917.....	79,681	149
1918.....	88,456	168
1919.....	70,945	129
Five years.....	338,945	
Annual average.....	67,789	127

*Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).*

[Figures from publications of the Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	39,275,977	63.1	5,243	8.8	1915...	67,336,992	67.1	2,419	3.6
1912...	63,427,247	63.2	4,034	6.7	1916...	71,621,632	70.2	2,355	3.3
1913...	63,298,718	63.1	5,498	8.7	1917...	75,307,906	72.7	3,124	4.1
1914...	65,989,295	66.8	4,340	6.6	1918...	81,868,104	77.8	2,333	2.9

### SMALLPOX.

The following table shows the number of cases of smallpox reported in 21 States during the five-year period 1915 to 1919, with case rates per 100,000 population. The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Oregon, South Carolina, Vermont, Virginia, Washington, and Wisconsin. The combined population of these States January 1, 1920, was about 55,377,000, being about 52 per cent of the population of the continental United States.

*Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).*

Year.	Number of cases reported.	Case rate per 100,000 population.
1915.....	20,886	0.40
1916.....	12,996	25
1917.....	25,639	47
1918.....	46,498	86
1919.....	35,286	64
Five years.....	140,705	
Annual average.....	28,141	53

[Figures from Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	53,275,977	63.1	130	0.2	1915...	67,336,992	67.1	169	0.3
1912...	63,277,247	63.2	135	.2	1916...	71,621,632	70.2	114	.2
1913...	63,298,718	63.1	125	.2	1917...	75,307,906	72.7	204	.3
1914...	65,989,295	66.8	212	.3	1918...	81,868,104	77.8	338	.4

### TYPHOID FEVER.

The following table shows the number of cases of typhoid fever reported in 20 States during the five-year period 1915 to 1919, with case rates per 100,000 population. The States included are Alabama, California, Connecticut, District of Columbia, Indiana, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Oregon, South Carolina, Virginia, Washington, and Wisconsin. The combined population of these States January 1, 1920, was about 55,025,000, being about 52 per cent of the population of the continental United States.

Year.	Number of cases reported.	Case rate per 100,000 population.
1915.....	49,668	79
1916.....	42,897	82
1917.....	37,921	71
1918.....	29,233	54
1919.....	23,109	42
Five years.....	173,830	
Annual average.....	34,766	65

Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).

[Figures from publications of Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	12,451	21.0	1915...	67,336,992	67.1	8,332	12.4
1912...	60,427,247	63.2	9,897	16.5	1916...	71,621,632	70.2	9,510	13.3
1913...	63,298,718	65.1	11,323	17.9	1917...	75,307,906	72.7	10,089	13.4
1914...	65,989,295	66.8	10,185	15.4	1918...	81,868,104	77.8	10,167	12.4

#### TYPHUS FEVER.

Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1917, inclusive (not including soldiers, sailors, and marines).

[Figures from publications of Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	5	(1)	1915...	67,336,992	67.1	2	(1)
1912...	60,427,247	63.2	6	(1)	1916...	71,621,632	70.2	85	(1)
1913...	63,298,718	65.1	8	(1)	1917...	75,307,906	72.7	16	(1)
1914...	65,989,295	66.8	3	(1)					

<sup>1</sup> Less than one-tenth of 1 per 100,000 population.

#### WHOOPING COUGH.

Deaths (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918, inclusive (not including soldiers, sailors, and marines).

[Figures from publications of Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	6,682	11.3	1915...	67,336,992	67.1	5,421	8.1
1912...	60,427,247	63.2	5,619	9.3	1916...	71,621,632	70.2	7,284	10.2
1913...	63,298,718	65.1	6,332	10.0	1917...	75,307,906	72.7	7,837	10.4
1914...	65,989,295	66.8	6,810	10.3	1918...	81,868,104	77.8	13,728	16.8

Deaths, all causes (exclusive of stillbirths) in the registration area of the United States, 1911 to 1918 inclusive (not including soldiers, sailors, and marines).

[Figures from Bureau of the Census.]

Year.	Population.		Deaths.	Death rate per 100,000.	Year.	Population.		Deaths.	Death rate per 100,000.
	Estimated number.	Per cent of total.				Estimated number.	Per cent of total.		
1911...	59,275,977	63.1	839,284	14.16	1916...	71,621,632	70.2	1,001,921	13.99
1912...	60,427,247	63.2	838,251	13.87	1917...	75,307,906	72.7	1,006,711	14.16
1913...	63,298,718	65.1	890,848	14.07	1918...	81,868,104	77.8	1,445,138	17.65
1914...	65,989,295	66.8	898,039	13.61	1919...				12.9
1915...	67,336,992	67.1	909,155	13.50					

#### IV. CONSIDERATIONS RELATIVE TO THE OUTBREAK AND DEVELOPMENT OF BUBONIC PLAGUE AND EXANTHEMATIC TYPHUS, METHODS EMPLOYED TO COMBAT THEM, AND THE RESULTS OBTAINED.

##### EXANTHEMATIC TYPHUS.

Up to 1912 American physicians, if they gave the disease any consideration at all, regarded typhus as an exotic plague, and as a sort of medical curiosity having little more than historic interest. In that year the studies made by Anderson and Goldberger clearly demonstrated that the disease was epidemic in the city of New York at least. Since that time there have been reports of cases of apparently local origin in several of the larger American cities, such as Baltimore, Philadelphia, Atlanta, Milwaukee, Chicago, and Boston. These developments have given to this ancient disease a new importance for the American clinician and sanitarian. Recently this interest has been further emphasized by its prevalence in Europe during the World War and by its threatened invasion from abroad.

The Weil-Felix reaction, which has recently come into use as a means of diagnosing typhus fever, is of special interest in that an organism which has not been shown to be etiologically concerned in the disease can nevertheless be used for the diagnosis of typhus fever in the same way that the typhoid bacillus is used in the diagnosis of typhoid fever by the well-known Widal test. Whether it may ultimately be shown that the reaction is due to the presence of secondary invaders of the Proteus-like organisms, which are used in the test, or whether it is entirely nonspecific, the reaction is still a very useful one, for the reason that no satisfactory laboratory method of diagnosing typhus fever, aside from animal inoculations, had previously been discovered. There has been a considerable de-

mand for the cultures of *B. proteus*, which are used for the test, and a number of specimens of serum have been examined at the hygienic laboratory of the Public Health Service.

Since the last meeting of this conference studies have firmly established the fact that typhus fever is transmitted from person to person by means of the body louse, and most investigators believe that it is transmitted in no way other than by the bite of an infected louse. Several careful observers, however, have the impression that exceptionally and rarely typhus may be transmitted by some other means to those who come into close intimacy and contact with patients.

Although this disease is not liable to become epidemic in the United States, the extensive typhus epidemics now prevailing in eastern Europe have caused the United States authorities to extend and strengthen the quarantine regulations against the introduction of this disease. Delousing of all third-class passengers proceeding to the United States is required at all European ports.

### BUBONIC PLAGUE.

A new outbreak of bubonic plague occurred in New Orleans, La., the first human case being discovered October 29, 1919.

The following table shows the progress of the outbreak:

NEW ORLEANS, LA.

Month.	Rodent catch.	Infected rodents.	Human cases.
1919			
October.....	16,787	192	1
November.....	27,424	206	6
December.....			5
1920			
January.....	28,145	148	0
February.....	30,599	66	0
March.....	36,755	23	0
April.....	44,988	11	0
May.....	47,545	7	2
June.....	33,492	4	2
July.....	24,342	1	1
August.....	34,588	0	2
September.....	30,878	2	0
October 1 to 25, inclusive.....	26,890	0	0
Total.....	379,639	573	19

Plague appeared in Pensacola, Fla., June 14, 1920, in Galveston, Tex., June 16, and in Beaumont, Tex., June 26, the first human cases occurring on these dates.

The following tables show the progress of the outbreak in Pensacola, Galveston, and Beaumont:

PENSACOLA, FLA.

	Rodent catch.	Infected rodents.	Human cases.
1920.			
June.....	2,705	7	4
July.....	6,253	15	3
August.....	3,798	7	2
September.....	2,184	2	1
Oct. 1 to 22, inclusive.....	2,253	0	0
Total.....	17,235	31	10

GALVESTON, TEX.

	Rodent catch.	Infected rodents.	Human cases.
1920.			
June.....	1,451	8	2
July.....	11,022	35	3
August.....	14,108	10	3
September.....	7,511	3	3
Oct. 1 to 22, inclusive.....	9,700	2	3
Total.....	43,802	58	17

BEAUMONT, TEX.

	Rodent catch.	Infected rodents.	Human cases.
1920.			
June.....	0	0	3
July.....	12,279	105	8
August.....	11,850	15	3
September.....	6,899	2	0
Oct. 1 to 22, inclusive.....	4,905	1	0
Total.....	35,680	123	14

The measures taken in New Orleans and which proved successful in controlling the outbreak were afterwards carried out with similar success in Pensacola, Galveston, and Beaumont. These measures were general and special.

General measures employed were publicity, rodent destruction, laboratory examination of all rodents trapped or found dead, rat proofing of buildings and wharves, proper collection and disposal of garbage, and maintenance of outgoing quarantine, both maritime and overland.

Special measures included prompt destruction of rat harbors, especially in and around infected foci, treatment of foci by hydrocyanic gas, and flea destruction by use of pulicide solution. For the control of the infection and prevention of its spread special stress was placed upon rat trapping.

The human cases give a very poor index of the extent or degree of plague infection and the best index is furnished by the ratio of infected rodents to the total rat catch.

By intensive trapping the extent of infection was accurately delimited and the principal foci located and given special treatment.



In New Orleans from November 1, 1919, to October 27, 1920, 379,639 rodents were examined in the laboratory and of these 573 were found infected with plague.

The efficiency of the measures taken is clearly shown by the tables. The steady decline in the number of infected rodents in spite of the fact that intensive trapping is maintained shows that the desired results are being attained.

In addition to the active suppressive measures vigorously prosecuted in New Orleans, Pensacola, Galveston, and Beaumont, rat surveys were made in Mobile, Ala., Key West, Fla., Savannah, Ga., and Charleston, S. C. Although many thousand rodents were caught and examined in the laboratories in these cities no infected rodents were discovered.

### INFLUENZA.

So far as the most careful scientific investigators have been able to determine neither a cure nor a specific has been discovered for influenza. As regards preventive measures, the efficacy of those carried out in recent months is not proved, and we can only continue to follow the apparently sound principles already applied. It seems hardly logical to expect that any measure short of effective specific immunization will afford lasting protection to the general public.

Since it is probable that the germ of influenza, whatever its nature, is carried about not only by those who are ill with influenza, but by persons who may be entirely well, everything which increases personal contact, therefore, should be regarded as a factor in spreading the disease.

Suggestions were sent out by the service in the fall of 1919 to the health officers of the country regarding steps which should be taken to meet any recurrence of influenza. These were in part as follows:

1. All physicians should be required to report to the health officer all cases of diseases suspected to be influenza.
2. Cases having symptoms of the disease should be carefully isolated.
3. The use of masks and the disinfection of hands should be practiced by those in attendance on cases of influenza or cases suspected of being influenza.
4. Steps should be taken to effect organizations for furnishing medical care for influenza cases in case of an epidemic.
5. The ordinary means of controlling communicable diseases, such as afforded by inspections of public restaurants and soda fountains, should be improved by ordinance or board of health regulations.
6. It is not believed that much benefit will be derived from closing schools in highly congested districts, as the children will simply be

allowed to run on the streets, and the danger of transmitting the infection of influenza will not be decreased. In suburban districts, however, the closing of the schools may be a very desirable means of controlling the epidemic.

7. Individuals should endeavor to improve their vital resistance to disease by careful attention to the laws of health, calling in a physician as soon as any symptoms of influenza appear.

Results of experiments carried on by service officers indicate presumptively that influenza may be transmitted by means of the secretions of the upper respiratory passages from patients in the early stages of the disease, probably within less than 12 hours from onset.

No evidence has been obtained in carefully controlled experiments that influenza vaccines are of value. Their use, therefore, has not been recommended as a means for controlling the disease.

Statistical investigations made by the service and by other authorities would tend to show that a short immunity (probably for from 7 to 10 months) is conveyed by an attack of influenza, but that after an additional period of the same or less duration the immunity has disappeared.

Neither the laboratory work of the service nor that carried on at other laboratories has solved many of the puzzling features of the disease.

### METHODS USED TO AVOID PROPAGATION OF COMMUNICABLE DISEASES.

In giving measures which have been adopted to avoid the propagation of the various communicable diseases which have prevailed in the United States only such data as are thought to be new or of particular interest to the conference are included.

#### ANTHRAX.

As the result of investigations of anthrax the quarantine regulations, both foreign and domestic, were amended in 1918 so as to prohibit the sale of brushes made from material that had not been disinfected by means of steam or by boiling. At the same time an effective procedure for the sterilization of brushes in trade channels was given out to the proper authorities. The problem of disinfecting hides contaminated with anthrax is still under study. The diseases among handlers of raw hides can, however, be greatly reduced by strict attention to personal cleanliness, the use of respirators, and the installation of proper ventilating apparatus in tanneries and woolen mills.

Antianthrax serum is still being studied with a view to standardization. It is believed that it will be possible to distribute for standardization purposes dried spores of the anthrax bacillus and a test serum which would give the minimum of protection which might reasonably be expected in the commercial product.

#### DEER-FLY FEVER.

Recent investigations of the Public Health Service have shown that deer-fly fever, a plaguelike disease which appears to be limited to certain portions of Utah, is probably due to the organism *B. tularensis*. The host is the jack rabbit, and the disease is transmitted to man by the bite of the infected deer fly (*Chrysops discalis*). The extermination of the jack rabbit by means of poisoned grain during the winter season is advocated.

#### DIPHTHERIA.

The application of the Schick test to children and contacts has come into general use during the last few years.

#### HOOKWORM.

The treatment of hookworm disease still consists mainly of the administration of thymol. The efficiency of carvacrol, a synthetic preparation, in the treatment of hookworm has been studied recently and its toxicity and anthelmintic power have been established. The Public Health Service, in cooperation with the Department of Agriculture, has started an extensive investigation having in view the isolation of an active principle from American worm-seed oil (*chenopodium*) which would possess constant toxicity and therapeutic efficiency for use in the treatment of this disease.

#### INFLUENZA.

In spite of the work of the most careful scientific investigators neither a cure nor a specific has been discovered for influenza. As regard preventive measures, the efficacy of those carried out in recent months is not proved, and we can only continue to follow the apparently sound principles already applied. It seems hardly logical to expect that any measure short of effective specific immunization will afford lasting protection to the general public.

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Statistical investigations made by the service and by other authorities would tend to show that a short immunity (probably for from 7 to 10 months to from 14 to 20 months) is conveyed by an attack of influenza.

Neither the laboratory work of the service nor that carried on at other laboratories has solved many of the puzzling features of the disease.

#### MALARIA.

Malaria control measures have consisted of elimination of the malaria mosquito through drainage, filling, oiling, ditching, use of fish, etc., the preventing of access of mosquitoes to houses by screening, and immunization by administration of quinine. Demonstrations of the service in malaria control have brought excellent results.

The subcommittee on medical research of the National Malaria Committee recommended in 1919 a standard method of quinine administration in the treatment of malaria.

#### MENINGITIS.

Studies of grouping of the meningococci based on serum reactions have resulted in placing the grouping of a large number of strains of American meningococci on a satisfactory basis. The selection of representative strains for the manufacture and testing of commercial antimeningococcus serum has been of great practical importance and these cultures have been distributed to all manufacturers in the United States. The protective value of antimeningococcus serums as demonstrated by other workers has been confirmed.

#### PNEUMONIA.

Recent investigations indicate that apparently some protection is afforded by pneumonia vaccine, although it is not so great as earlier reports from military and other sources led us to believe it would be. The duration is uncertain; apparently it does not run beyond a few months. Recent work has confirmed the earlier impression that the saline suspension of pneumococci has better immunizing properties than the oil suspension, i. e., the so-called lipovaccines.

#### TRACHOMA.

The measures taken have had as their object the elimination of the foci of the disease and the improvement of community sanitation. The betterment of sanitary conditions and the education of children in individual prophylaxis have been stressed. The care of the individual case is largely a surgical matter.

The Public Health Service has developed an operative treatment which has been used with splendid success in their hospitals and field clinics. Data regarding the service's trachoma work are given in section 6.

#### OTHER DISEASES.

No remedies with specific properties have been found for tuberculosis, encephalitis lethargica, or poliomyelitis. Methods in use in the treatment of leprosy, typhus fever, plague, and venereal diseases are given in other sections of this memoir.

### V. FREQUENCY OF EPIDEMIC CEREBROSPINAL MENINGITIS, TRANSMISSIBLE ANTERIOR POLIOMYELITIS, AND LETHARGIC ENCEPHALITIS.

#### LETHARGIC ENCEPHALITIS.

During the late winter or early spring of 1919 a number of cases of lethargic encephalitis were reported in the United States. The disease is not reportable, and it is impossible to give figures showing the number of cases or deaths which have occurred, but cases of the disease, usually widely scattered, have been reported since March, 1919, from a number of States in different parts of the country.

### VI. ACTUAL STATUS OF THE COMBAT AGAINST TUBERCULOSIS, YELLOW FEVER, MALARIA, TRACHOMA, AND ANKYLOSTOMIASIS.

#### TUBERCULOSIS.

Between 1911 and 1919 the death rate from tuberculosis in the registration area of the United States was decreased 6.9 per cent. It fell from 200.3 in 1904 to 146.3 in 1917, representing a saving of nearly 56,000 lives for the population involved in the registration area for the year 1917. In communities where special intensive efforts are made greater reductions have been accomplished. At the present time, however, among deaths from all causes at all ages one in 10 is due to tuberculosis. The same proportion obtains in children under 15 years of age, among whom 10 per cent of deaths are due to tuberculosis in various forms. As a cause of death it has fallen during the last nine years from first place to second, having been superseded by diseases of the heart and arteries. At the present time approximately 200,000 deaths from tuberculosis occur in the United States each year, and it is believed that more than 1,000,000 active cases of the disease in its various manifestations are constantly present. Of all deaths from tuberculosis 8 per cent are due to the bovine bacilli, practically all of such infections being of the surgical variety and most of the fatalities occurring in children. The morbidity and mortality vary greatly among the different races composing the population and in various communities, depending upon the economic status, the habits, and the prevailing industries. The death rate from tuberculosis among the colored population is from two and a half to four times greater than that prevailing among whites. A survey made by the United States Public Health Service in 1912 of all the Indians in the United States to determine the pre-

valence of tuberculosis among the various tribes found an appalling morbidity and mortality, and one greatly in excess of the rates prevailing among the more civilized races, due largely to unhygienic living conditions, poverty, ignorance, and to racial susceptibility, which, however, does not appear to be as great as the susceptibility appearing among the colored races.

Progress has been made along conventional lines, involving diagnosis and care of the sick. Organizations varying in efficiency are found in every State, in the District of Columbia, and the Territories of Hawaii and the Philippines. There are approximately 1,100 local associations, which include in their operation every large city, the budgets aggregating \$4,000,000 for the year 1920. There are 600 hospitals and sanatoriums with an aggregate of 50,000 beds, and an annual expenditure of about \$20,000,000 as well as 500 dispensaries and clinics, most of which have well trained staffs of physicians and nurses. It is estimated that the expenditures in the United States for all moneys spent in the campaign against tuberculosis, including organizations, institutions, dispensaries, nurses, by both private and public agencies, aggregate approximately \$30,000,000. The development of home supervision has made some progress; the National Tuberculosis Association estimating that not less than 6,000 nurses in the United States employed either on part or full time in the daily routine incident to general health supervision devote considerable attention to cases of tuberculosis in domiciles or clinics. There has been a gratifying development in fresh-air schools both for tuberculous children and the anemic and undernourished. Approximately 3,000 children are thus provided for, including the provisions made for all fresh-air classes in special rooms as well as special schools.

Among the agencies performing important functions in this field the following should be mentioned:

#### NATIONAL TUBERCULOSIS ASSOCIATION.

The activities of this association are extended to every State in the Union, chief efforts being directed to the organization of new fields of activities along conventional lines and to the development of State, county, and municipal organizations as independent units. It has provided standards for sanatorium management, and furnishes expert advice and building plans for the construction of new institutions. It has cooperated in research work in community experiments and in other ways; has identified itself with the general education movement, not the least of which is the modern health crusade, whereby sanitary practices of a nature especially calculated to combat tuberculosis are taught to thousands of school children. This

association also publishes several important journals devoted to tuberculosis as well as directories and other important matters. It is, moreover, the pioneer in the movement to open general hospitals to tuberculous patients, having in 1916 gone on record at its general meeting as favoring such measures.

#### THE RUSSELL SAGE FOUNDATION.

This association has conducted an important housing experiment in New York City, where provision is made for families in which are included one or more tuberculosis subjects for the purpose of demonstrating the feasibility of home prevention and industrial independence among the class of people to which the experiment is devoted.

#### THE METROPOLITAN LIFE INSURANCE CO.

This company has contributed to research in social matters, particularly with that known as the "Framingham Health Demonstration" conducted at Framingham, Mass., under the auspices of the National Tuberculosis Association. This city of 10,000 people has been selected as representatives of the average American community, and in an experiment which has now lasted three years and is to be continued for a similar period intensive application has been made with encouraging results of all the special and general measures calculated to reduce tuberculosis morbidity and mortality.

#### AMERICAN SANATORIUM ASSOCIATION.

This association has been active in promulgating measures for improving sanatorium construction and has devised standards of requirements and a score card for the grading of institutions devoted to the care of the tuberculous into various classes.

#### UNITED STATES PUBLIC HEALTH SERVICE.

This is a bureau of the Federal Government which was first organized in 1798 for the care of sick and disabled American seamen. It still performs that function and includes among its other activities the medical examination of immigrants, the national and interstate quarantines, the licensing of laboratories manufacturing serums and vaccines for importation and interstate trade, and since the World War the medical care of sick and disabled men discharged from the military and naval forces. Of this latter class of beneficiaries it is anticipated that approximately 48,000 will require sanatorium care before 1925 and that nearly 14,000 beds will be needed for the pur-

pose. On October 21, 1920, there were 8,215 tuberculous ex-service men and women under treatment either in Government-owned hospitals or those under contract with the Public Health Service, which at present operates 11 sanatoriums for the tuberculous in addition to its 50 other hospitals in various parts of the United States.

The Public Health Service has promulgated regulations which require common carriers to see that tuberculous patients before being received for transportation must be provided with impervious sputum containers, paper napkins, etc., and enforce their use during the journey, as well as to disinfect the compartment occupied by the patient. It has led the way in a new movement by opening all its general hospitals to tuberculous patients for temporary periods, and its regulations provide that no such patients shall be refused admission because of lack of special facilities, it being well known that the resources of any well managed hospital are sufficient to enforce necessary sanitary precautions.

The reduction in tuberculosis mortality throughout the United States in the period 1911-1920 is not greater than the reduction in other preventable diseases and may be due in considerable degree to an improvement in living and working conditions rather than to special antituberculosis measures. This, however, is open to argument. While there is no question that conventional methods should be continued whereby sanatoriums, hospitals, dispensaries, clinics, and home care are provided for the sick, antisputting ordinances enforced and all other measures calculated to reduce exposure continued, there is a growing conviction that general health measures are also very important antituberculosis factors. Reduction of the incidence of typhoid fever, whooping cough, measles, influenza, malnutrition, dental caries, adenoids, and other diseases which impair nutrition, reduce the economic status, and increase the stress of life, is believed to bear an important and direct relation to the reduction of the morbidity and mortality due to tuberculosis.

A fundamental error is believed to have occurred in the initiation of the antituberculosis campaign and continued even to the present time, in that the diagnosis and treatment of the disease has been relegated by common consent to specialists in special institution and to a lamentable extent in special climates. As a result of this unfortunate practice and due largely to over emphasizing the communicability of tuberculosis, it results that the general medical practitioners of the United States are not greatly interested in tuberculosis and are not well trained in its detection or treatment. Diagnosis is delayed from one to two years in patients coming first under the observation of the general practitioner. Moreover, when a diagnosis is made by the family doctor he usually advises the patient to seek a "change of climate," relinquishing the case immediately.

He does this because it is the prevailing custom and also because he is not well trained in the treatment and dislikes to undertake the care of a case in the domicile, the patient being excluded from all hospitals except those devoted exclusively to tuberculosis. As results of this pernicious custom the general practitioner is denied opportunity to familiarize himself with tuberculosis and the laity are encouraged to continue to demand a change of climate for the tuberculous.

The training of physicians in the United States at present is most unsatisfactory. Not more than two medical schools are known to have professorships in tuberculosis for the instruction of students, although special chairs in venereal diseases, obstetrics, gynecology, diseases of the skin, diseases of the eye, and of the nose and throat are universal. Not until sufficient stress is placed by medical schools upon the correct teaching of this important subject, and general hospitals have been opened to tuberculous patients thus providing among other benefits the opportunity of teaching tuberculosis, will the general practitioner of medicine become sufficiently trained and interested in this disease to make it practicable to insure early diagnosis and adequate care near the patient's home. Of scarcely less importance is the necessity of providing proper textbooks in hygiene for elementary public schools whereby the instruction of children may be carried out to insure the enlightenment of the rising generation, which will also involve the preparation of public school teachers to give instruction in hygiene.

#### SUMMARY.

Satisfactory progress has been made during the period 1911-1920 in organization for routine relief, but very little has been done in the even more important educational measures and propaganda whereby the public will be made aware of the fact that infection is practically universal, that each adult is a potential case of tuberculosis, and that prevention involves the alleviation of all stresses in life, including those subject only to personal control, as well as those relating to industrial, economic, and social conditions.

Living tubercle bacilli have been demonstrated with alarming frequency in unpasteurized market milk of many cities. Efforts to eradicate tuberculosis among cattle have been continued, but without gratifying results. The Bang method affords the most practical solution of the problem among animals, but it is not generally applied.

Some of the larger cities prohibit the employment of sufferers from tuberculosis and other communicable diseases in industries involving the handling, preparation, and serving of food and drink. Tuberculosis is everywhere reportable in the registration area, but segrega-

tion of the careless consumptive is provided for in comparatively few communities, and in no city or State is satisfactory provision made for the segregation of open cases of tuberculosis from young children. There are no laws preventing the marriage of tuberculous persons.

No remedy has been found with specific properties. Research in this field is being extended to chemo-therapy, including the selective dyes. Tuberculin is passing out of vogue and no longer holds, except in the opinion of a few, an important place in therapy or diagnosis of clinically active disease. No serum or vaccine with curative or prophylactic virtues has been found, although many extravagant claims are made for these and other so-called remedies. The Federal Department of Justice and the Post Office Department have given valuable assistance in preventing the sale of fraudulent remedies which still abound and are difficult to suppress.

#### YELLOW FEVER.

Due to the strict measures carried out at all United States quarantine stations, no cases of yellow fever have been reported in the United States during the period, 1911 to 1920.

During 1918-19 a commission, headed by Prof. Noguchi of the Rockefeller Institute, made a study of yellow-fever etiology in Guayaquil, and the announcement later that the causative agency is a spirocheta morphologically similar to that of Weil's disease.

One member of this delegation has had opportunity to observe the administration, during a small outbreak of yellow fever in Guatemala in August-September, 1920, of the vaccine prepared by Prof. Noguchi as a prophylactic, and although the number of observations was too small to arrive at definite conclusions, and despite two cases occurring in vaccinated persons, believes the vaccine to be a great aid in elimination of epidemics in small places.

#### MALARIA.

It is estimated that there are seven or eight million cases of malaria annually in the United States, causing an economic loss to the country which could be conservatively placed at the sum of \$800,000,000.

The United States Public Health Service has definitely demonstrated that many localities can eliminate malaria at a reasonable cost and that the best way of inducing the public to do so is to carry on carefully planned demonstration campaigns in badly infected areas.

A cooperative agreement has been entered into between the Public Health Service, State and local health departments and the Inter-

national Health Board for the purpose of promoting and accelerating the control of malaria in the United States. Under the agreement the service makes malaria surveys, prepares estimates of cost of malaria control measures, and furnishes supervision of the control demonstrations; the State health authorities selecting the areas in which these demonstrations are to be conducted, and, together with the local health authorities, providing necessary funds to cover the cost of the control measures employed. In certain instances where the State and local authorities are unable to provide the necessary funds, these are furnished by the International Health Board. Under this agreement malaria control investigations have been extended during the past fiscal year into 11 States. In July, 1920, 101 places were doing malaria work under the supervision of the Public Health Service and had up to that time appropriated over \$350,000 therefor. Two southern railroads have undertaken malaria control on an extensive scale and three other interstate railroads have made requests for malaria surveys. State departments of health are also beginning to appropriate money for the investigation and control of malaria in their States.

Biological studies being conducted at the United States malaria laboratory include longevity of mosquito life, viability of malaria parasites in mosquitoes, and the ultimate seasonal infection of malaria mosquitoes.

The malaria field investigations of the service consists of rice-field studies, studies of impounded waters, study of the economic loss from rural malaria, and study of quinine administration in its control, investigation of plants affecting mosquito production, experimental use of fish in mosquito larvæ control, and observations of the feeding habits of *Anopheles* mosquitoes.

#### ANKYLOSTOMIASIS.

The Rockefeller commission carried on an intensive educational medical and sanitary campaign against hookworm disease in the Southern United States during the five years 1910-1914, in cooperation with the various Southern State boards of health and the United States Public Health Service. Briefly stated this campaign consisted in (a) making the practitioners of medicine more familiar with the nature, diagnosis and treatment of the disease, (b) exciting general public interest by newspaper publications, lectures, demonstrations, and especially by free field clinics, (c) urging improved sanitation, and (d) increasing the general interest in public health so that the various boards of health were placed upon a better administrative and financial basis.

During the cooperative work for the five-year period in question, 250,680 rural homes were inspected as respects excreta disposal, specimens from 1,273,345 persons were examined microscopically for hookworm disease, free treatment was dispensed to 440,376 persons, 254,118 persons were reported as treated by physicians, over 25,000 addresses were given reaching over 2,000,000 people, and more than 3,300,000 pieces of literature were distributed free.

As a result of the increased clinical interest in the disease, there has been a marked decrease in the severer types and a distinct improvement in the economic conditions of many localities. One of the most important results of the campaign has been the greater public interest in public health matters and the improved organization and financial status of boards of health. Undoubtedly the weakest part of the campaign was the relatively secondary general improvement in sanitation.

Upon the expiration of five years' intensive campaign financed by Mr. Rockefeller, hookworm disease took its place in the regular line with other infectious diseases as one to be considered in the routine schedule of work and although considerable money has been spent in combating it, the method of procedure has not been so pre-eminently a hookworm campaign as that which obtained from 1910 to 1914. A number of State boards of health have received financial aid from the International Health Board (financed by Mr. Rockefeller) which has enabled them to emphasize the hookworm work, but the tendency now is to broaden the scope of the efforts into a more general campaign of rural sanitation and to emphasize more prominently the building of privies rather than the holding of free clinics.

As early as 1911 the United States Public Health Service felt that improvement in sanitation, in order to give more permanent results, should be emphasized more seriously, and in accordance with this idea a plan was gradually developed to cooperate with State and counties in conducting general campaigns for building privies in order to decrease not only hookworm infection, but also other soil-pollution diseases, such as typhoid fever, dysenteries, etc. The present position of the service is that, while fully recognizing the value of the clinics as educational and health factors, permanent and broader results can be brought about better by emphasizing more and more a general improvement in methods of excreta disposal in order to reduce soil-pollution diseases in general. Following this policy the service is now actively cooperating with various State and county boards of health in a general campaign for improved rural sanitation, including all phases of public health, and correlated with this the service has established a board to study the whole subject of excreta disposal in rural districts.

## TRACHOMA.

For the purpose of cooperating with the State and local health authorities in the treatment and prevention of trachoma, the Public Health Service is now operating five hospitals for the treatment of the disease in communities where it is most prevalent. Trachoma surveys and field clinics are also conducted in the various States. By means of the field clinics physicians are given instruction in the diagnosis and treatment of trachoma, and methods for the prevention of the spread of the disease are made known to the public. These methods have resulted in eradicating trachoma from a number of districts where it was previously prevalent. During the fiscal year ending June 30, 1920, 10,395 cases received treatment at the hospital dispensaries and 2,500 cases were operated on at the hospitals and field clinics.

The State of Ohio has established a trachoma bureau under its department of health. Kentucky is about to organize a bureau for cooperation with the Public Health Service in this work. Other States have also made appropriations and contributions for furthering the campaign against trachoma.

## VII. DATA RELATIVE TO LEPROSY AND THE MEASURES PUT IN PRACTICE TO PREVENT ITS DIFFUSION.

### LEPROSY.

For some years the belief has been gaining ground that leprosy could be cured, and encouraging progress was made by several investigators. The starting point for this study was the observation that now and then the course of the disease appeared to be favorably influenced by treatment with chaulmoogra oil. The treatment, however, was attended with many difficulties and could not be carried out in all cases. At this point the Public Health Service enlisted the cooperation of President A. L. Dean of the University of Hawaii, suggesting that attempts be made, either to isolate the active constituent of this drug or to devise means for making its continued administration feasible. The latter has been accomplished by preparing the ethyl esters of the fatty acids of chaulmoogra oil. The treatment has been carried on at the leprosy investigation station of the service at Kalihi, Hawaii, the work being directed by Acting Asst. Surg. J. T. McDonald, director of the station. The following conclusions have been drawn from the recent experiments conducted at Kalihi Hospital:

1. The intramuscular injection of the ethyl esters of the fatty acids of chaulmoogra oil usually leads to a rapid improvement in the clinical symptoms of leprosy. In many cases the lesions disappear except for scars and permanent injuries and the leprosy bacillus can no longer be demonstrated.

2. When combined with iodine the fatty acids of chaulmoogra oil and their esters give good results, but there is no adequate experimental proof that this addition of iodine causes any increase in the effectiveness of the materials used.

3. All of the available evidence obtained from the use of fractions of the fatty acids of chaulmoogra oil indicates that the therapeutic action is due to one or more of the fatty acids of the oil or to some as yet unidentified substance associated therewith. The various methods of fractionation heretofore employed have failed to demonstrate the active agent.

4. Although conclusive evidence is not at hand, it is probable that the oral administration of chaulmoogra oil derivatives is of minor importance compared with the injections.

5. In treating leprosy it is important to make use of all auxiliary agencies to build up and maintain bodily vigor.

6. Hypodermic injections of the ethyl esters into leprosy nodules are followed by marked swelling with ultimate recession of the lesions. This is a valuable auxiliary treatment for especially resistant lesions.

At the present time the treatment has been administered only at the receiving station, but it is hoped to provide facilities for the treating also of lepers in the leper colony at Molokai. As stated in another section of the memoir, it is also intended to use this new method of treatment in the national leprosarium which will be opened during the coming fiscal year.

The decision as to apparent cure has in the case of each patient been officially determined, not by officers of the Public Health Service, but by a special parole board which alone has authority to discharge a patient from custody. About 75 patients have been paroled in the last two years.

The Public Health Service is now conducting a very careful study of the treatment, making detailed records of all the cases and taking photographs of the lesions once a month. It will naturally require some time, probably years, to determine whether a real cure for leprosy has been discovered.

## VIII. ACTUAL STATUS OF THE COMBAT AGAINST AVARIOSIS (VENEREAL DISEASES).

The progress that has been made in establishing measures for control of venereal infections has been so rapid during the past few years that it is felt a fairly complete statement of the development of this work should be made at this time. This important phase of public-health work is now receiving not only legislative attention by national governments but by State and city health authorities as well. The part which the Public Health Service has played in this important development may be briefly outlined as follows:

In order to meet the responsibility of protecting the health of American citizens, with a view of increasing national efficiency on account of the World War, the Surgeon General of the Public Health Service put into effect a Nation-wide plan for the control of venereal diseases. For the purpose of organizing this Nation-wide plan the following telegram, letter, and memorandum were sent on January 2, 1918, to the health officers of all the States:

[Telegram.]

Control venereal infections in connection prosecution of the war constitutes most important sanitary problem now confronting public-health authorities of United States. Plan of control mailed you to-day. Request your cooperation forceful enforcement same. Venereal infections should be made reportable and quarantinable means of diagnosis and cure should be provided. Campaign wisely conducted publicity should be launched. Please inform me your action in premises.

BLUE,

*Surgeon General, United States Public Health Service*

[Letter.].

SIR: My telegram of this date as follows is hereby confirmed:

"Control venereal infections in connection prosecution of the war constitutes most important sanitary problem now confronting public-health authorities of United States. Plan of control mailed you to-day. Request your cooperation forceful enforcement same. Venereal infections should be made reportable and quarantinable means of diagnosis and cure should be provided. Campaign wisely conducted publicity should be launched. Please inform me your action in premises."

It is evident that the prevention of venereal infections in the military population is largely dependent on the degree with which these infections are prevented in the civil community. This imposes upon the civil health authorities the duty of forcefully attacking the venereal problem upon the basis of the control of communicable disease.

There is forwarded you herewith an outline upon which it is proposed to make this attack. Manifestly, no plan which can be set forth at the present time can be complete in all its details nor can a plan be devised which in all its phases fits the requirements of each State exactly. Therefore, in the plan



which I am sending you only the basic necessities have been stressed. Your cooperation in putting this plan in force is requested.

The Public Health Service in cooperation with the Red Cross and the Medical Department of the Army is establishing venereal clinics in cities in immediate contiguity to the Army cantonments. There is even greater need for the beginning of an active antiveneral campaign in those cities which are outside of the military zones, but into which soldiers go in search of recreation. Most important of all, perhaps, is the thorough education of the general public to the end that this disease group will be considered in the same light as are the other communicable infections. This will permit the free and frank discussion of this important question without offense to modesty.

I shall be pleased to have your views and suggestions as to the prosecution of further work along these lines. Whatever is to be done must be initiated promptly if we are to prevent the next increment of the draft from having the high venereal rate of the last.

Respectfully,

RUPERT BLUE,  
Surgeon General.

[Memorandum.]

#### MEMORANDUM RELATIVE TO THE CONTROL OF THE VENEREAL DISEASES.

##### 1. Epidemiology.

- (a) Peculiar to the human species.
- (b) Chronic diseases.
- (c) Spread by contact—not necessarily sex contact—chronic carriers.
- (d) Very prevalent in all classes of society.
- (e) Most prevalent in classes of low inhibition.

##### 2. Control.

- (a) Depends upon the control of infected persons.
- (b) Control of infected persons depends upon knowledge of their whereabouts. This may be determined by:
  - (1) Morbidity reports by serial number (in the case of private practitioners), name to be disclosed when infectious persons cease treatment. Case then followed up by health department which enforces quarantine act.
  - (2) Morbidity reports from venereal clinic and hospital.
  - (3) Legal enactment necessary to secure morbidity reports.
  - (4) Enact and enforce ordinance requiring pharmacists to keep record (open at all times to health department) of sales of drugs for the prevention and treatment of gonorrhea and syphilis.
- (c) Object of this control is to prevent contact between infected and non-infected persons.
- (d) May be obtained by:
  - (1) Quarantine of infected persons.
  - (2) Cure of infected persons.
  - (3) Education of general public to avoid direct and indirect contact with persons infected or presumably infected.

##### 3. Quarantine of infected persons.

- (a) Those who desire cure and can afford treatment.
  - (1) These are instructed by their physicians and theoretically are thus quarantined.

##### 3. Quarantine of infected persons—Continued.

- (b) Those who desire cure and can not afford treatment.
  - (1) Means should be provided for the free treatment of this group.
    - (a) Accurate diagnosis.
    - (b) Dispensary relief.
    - (c) Hospital relief.
- (c) Those who are careless or willful in the distribution of these infections through promiscuity.
  - (1) These for the most part are the ignorant or the criminal classes. Careful physical examination of all persons entering jails or other public institutions, those found infected to be isolated either in a special hospital or under a probation officer who enforces dispensary relief.

##### 4. Cure of infected persons.

- (a) Establishment of venereal clinics by health authorities.
  - (1) Federal, in zones in close contiguity to cantonments.
  - (2) State, in situations where local authorities refuse or fail to establish clinic.
  - (3) City, particularly those cities in which commercialized or clandestine prostitution flourishes for the patronage of soldiers but is beyond the authority of the Secretary of War.
  - (4) Country, in thickly settled rural communities.
- (b) By the creation of new or the utilization of existing hospital facilities.
  - (1) For the treatment of those who volunteer for treatment.
  - (2) For the obligatory treatment of persons under control of the courts.
- (c) By legal enactment.
  - (1) Declaring the venereal infections to be quarantinable.
  - (2) By substituting confinement to hospital for confinement to jail in the case of those convicted by courts and having venereal infections.
  - (3) By substituting remanding to a probation officer for the imposition of fines.
  - (4) To carry out 2 and 3 it is necessary that all persons arrested be examined by the city physician or other authorized person.
  - (5) By arrest of acknowledged and clandestine prostitutes by policewomen.

##### 5. Public education.

- (a) Relieve problem of all moral and social issues and place campaign solely on basis of control of communicable disease.
- (b) Propaganda of wisely conducted publicity.
  - (1) Through public meetings addressed by forceful speakers.
  - (2) Through public prints.
  - (3) By placarding public toilets, placards to emphasize danger of venereal diseases and to recommend prompt treatment either by competent physician or at the free venereal clinic.
  - (4) By follow-up work by social workers.
  - (5) By the education of infected persons.
    - (a) By physicians in private practice.
    - (b) By venereal clinic and hospital.

The detailed program outlined in the memorandum has been the basis of State legislation for the control of venereal diseases during the past two years. Shortly after this plan was launched through the State boards of health, detailed suggestions for State board of health regulations for the prevention of venereal diseases were prepared and approved by the Surgeons General of the Army, Navy, and Public Health Service. These regulations were as follows:

*Venereal diseases declared dangerous to the public health.*—Syphilis, gonorrhea, and chancroid, hereinafter designated venereal diseases, are hereby declared to be contagious, infectious, communicable, and dangerous to the public health.

*Rule 1. Venereal diseases to be reported.*—Any physician or other person who makes a diagnosis in, or treats, a case of syphilis, gonorrhea, or chancroid, and every superintendent or manager of a hospital, dispensary, or charitable or penal institution, in which there is a case of venereal disease, shall report such case immediately in writing to the local health officer, stating the name and address or the office number, age, sex, color, and occupation, of the diseased person, and the date of onset of the disease, and the probable source of the infection, provided that the name and address of the diseased person need not be stated except as hereinafter specifically required. The reports shall be inclosed in a sealed envelope and sent to the local health officer, who shall report weekly on the prescribed form to the State board of health all cases reported to him.

*Rule 2. Patients to be given information.*—It shall be the duty of every physician and of every other person who examines or treats a person having syphilis, gonorrhea, or chancroid to instruct him in measure for preventing the spread of such disease, and inform him of the necessity for treatment until cured, and to hand him a copy of the circular of information obtainable for this purpose from the State board of health.

*Rule 3. Investigation of cases.*—All city, county, and other local health officers shall use every available means to ascertain the existence of and to investigate all cases of syphilis, gonorrhea, and chancroid within their several territorial jurisdictions and to ascertain the sources of such infections. Local health officers are hereby empowered and directed to make such examinations of person reasonably suspected of having syphilis, gonorrhea, or chancroid as may be necessary for carrying out these regulations. Owing to the prevalence of such diseases among prostitutes and persons associated with them, all such persons are to be considered within the above class.

*Rule 4. Protection of others from infection by venereally diseased persons.*—Upon receipt of a report of a case of venereal disease it shall be the duty of the local health officer to institute measures for the protection of other persons from infection by such venereally diseased person.

(a) Local health officers are authorized and directed to quarantine persons who have or are reasonably suspected of having syphilis, gonorrhea, or chancroid whenever, in the opinion of said local health officer or the State board of health, or its secretary, quarantine is necessary for the protection of the public health. In establishing quarantine the health officer shall designate and define the limits of the area in which the person known to have or reasonably suspected of having syphilis, gonorrhea, or chancroid, and his immediate attendant are to be quarantined, and no persons other than the attending physicians shall enter or leave the area of quarantine without the permission of the local health officer.

No one but the local health officer shall terminate said quarantine, and this shall not be done until the diseased person has become noninfectious, as determined by the local health officer or his authorized deputy through the clinical examination and all necessary laboratory tests, or until permission has been given him so to do by the State board of health or its secretary.

(b) The local health officer shall inform all persons who are about to be released from quarantine for venereal disease, in case they are not cured, what further treatment should be taken to complete their cure. Any person not cured before release from quarantine shall be required to sign the following statement after the blank spaces have been filled to the satisfaction of the health officer:

I, \_\_\_\_\_, residing at \_\_\_\_\_, hereby acknowledge the fact that I am at this time infected with \_\_\_\_\_, and agree to place myself under the medical care of \_\_\_\_\_ within \_\_\_\_\_ hours,

Name of physician or clinic. Address. \_\_\_\_\_  
and that I will remain under treatment of said physician or clinic until released by the health officer of \_\_\_\_\_, or until my case is transferred with the approval of said health officer to another regularly licensed physician or an approved clinic.

I hereby agree to report to the health officer within four days after beginning treatment as above agreed, and will bring with me a statement from the above physician or clinic of the medical treatment applied in my case, and thereafter will report as often as may be demanded of me by the health officer.

I agree, further, that I will take all precautions recommended by the health officer to prevent the spread of the above disease to other persons, and that I will not perform any act which would expose other persons to the above disease.

I agree, until finally released by the health officer, to notify him of any change of address and to obtain his consent before moving my abode outside his jurisdiction.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

All persons signing the above agreement shall observe its provisions, and any failure so to do shall be a violation of these regulations. All such agreements shall be filed with the health officer and kept inaccessible to the public as provided in rule 10.

*Rule 5. Conditions under which the name of a patient is required to be reported.*—(a) When a person applies to a physician or other person for the diagnosis or treatment of syphilis, gonorrhea, or chancroid, it shall be the duty of the physician or person so consulted to inquire of and ascertain from the person seeking such diagnosis or treatment whether such person has theretofore consulted with or has been treated by any other physician or person and, if so, to ascertain the name and address of the physician or person last consulted. It shall be the duty of the applicant for diagnosis or treatment to furnish this information, and a refusal to do so or a falsification of the name and address of such physician or person consulted by such applicant shall be deemed a violation of these regulations. It shall be the duty of the physician or other person whom the applicant consults to notify the physician or other person last consulted of the change of advisers. Should the physician or person previously consulted fail to receive such notice within 10 days after the last date upon which the patient was instructed by him to appear, it shall be the duty of such physician or person to report to the local health officer the name and address of such venereally diseased person.

(b) If an attending physician or other person knows or has good reason to suspect that a person having syphilis, gonorrhea, or chancre is so conducting himself or herself as to expose other persons to infection, or is about so to conduct himself or herself, he shall notify the local health officer of the name and address of the diseased person and the essential facts in the case.

*Rule 6. Druggists forbidden to prescribe for venereal diseases.*—No druggist or other person not a physician licensed under the laws of the State shall prescribe or recommend to any persons any drugs, medicines, or other substances to be used for the cure or alleviation of gonorrhea, syphilis, or chancre, or shall compound any drugs or medicines for said purpose from any written formula or order not written for the person for whom the drugs or medicines are compounded and not signed by a physician licensed under the laws of the State.

*Rule 7. Spread of venereal disease unlawful.*—It shall be a violation of these regulations for any infected person knowingly to expose another person to infection with any of the said venereal diseases, or for any person to perform an act which exposes another person to infection with venereal disease.

*Rule 8. Prostitution to be repressed.*—Prostitution is hereby declared to be a prolific source of syphilis, gonorrhea, and chancre, and the repression of prostitution is declared to be a public-health measure. All local and State health officers are therefore directed to cooperate with the proper officials whose duty it is to enforce laws directed against prostitution, and otherwise to use every proper means for the repression of prostitution.

*Rule 9. Giving certificates of freedom from venereal diseases prohibited.*—Physicians, health officers, and all other persons are prohibited from issuing certificates of freedom from venereal disease, provided this rule shall not prevent the issuance of necessary statements of freedom from infectious diseases written in such form or given under such safeguards that their use in solicitation for sexual intercourse would be impossible.

*Rule 10. Records to be secret.*—All information and reports concerning persons infected with venereal diseases shall be inaccessible to the public except in so far as publicity may attend the performance of the duties imposed by these regulations and by the laws of the State.

#### NOTES AND SUGGESTIONS.

*Note 1.*—A rule providing penalties for violation of these regulations should be added if penalties are not specified by statute. It is thought preferable that the statute should prescribe a penalty for violation of regulations of the State board of health. In any case the State law should be examined to make sure that it either prescribes penalties or gives the State board of health power to do so. The statutes should also give the State board of health the powers suggested by the following wording: "The State board of health shall have power to make such regulations concerning venereal diseases, including the reporting thereof and quarantine of infected persons, as it may from time to time deem advisable."

*Note 2.*—It is recommended that provision for intensive treatment in suitable hospitals while patients are under quarantine shall be made by the municipalities, counties, or the State at public expense, and that adequate hospitals and clinic facilities of high standards shall be made available to voluntary and compulsory patients.

*Note 3.*—For the enforcement of these regulations it is recommended that States establish bureaus or divisions of venereal diseases under the State boards of health and appropriate the necessary funds.

*Note 4.*—The issuance of arsphenamine or equivalents to health officers, institutions, and physicians at State expense under suitable restrictions is a valuable measure for preventing syphilis, as these substances render cases of syphilis noninfectious in the shortest possible time.

*Note 5.*—Provision should be made for the examination of prisoners for venereal diseases and their treatment. If they are still infectious when their prison terms have expired, they should be quarantined and treated until they can be released with safety to the public health.

*Note 6.*—Laboratory tests for syphilis and gonorrhea should be made for physicians by the laboratories of the State board of health and the health departments of large cities.

*Note 7.*—Due provision should be made for follow-up work and social service in connection with the prevention of venereal diseases.

*Note 8.*—Institutions are needed for the segregation of persons who are, or are almost certain to become, venereal-disease carriers and who can not be adequately controlled in any other way. Sufficient provision for the segregation of the feeble-minded is most important.

*Note 9.*—It is recommended that the "floating" or "passing on" of persons having venereal disease from one community to another be prevented.

*Note 10.*—It is suggested that the bureau of venereal diseases carry on a campaign of public education in venereal-disease prevention, and in the conditions responsible for the dissemination of venereal diseases.

Twenty-six of the States accepted the venereal-disease control program as outlined by the Public Health Service and commenced inaugurating the necessary preliminary work for this purpose. The great interest shown in the problem of the venereal diseases resulted in Congress passing legislation whereby the control of these dangerous communicable diseases has been placed upon a permanent legal basis. This congressional legislation is known as the Chamberlain-Kahn Act and was passed by Congress July 9, 1918. The text of this bill is as follows:

*Interdepartmental Social Hygiene Board:* That there is hereby created a board to be known as the Interdepartmental Social Hygiene Board, to consist of the Secretary of War, the Secretary of the Navy, and the Secretary of the Treasury as ex officio members, and of the Surgeon General of the Army, the Surgeon General of the Navy, and the Surgeon General of the Public Health Service, or of representatives designated by the Secretary of War, the Secretary of the Navy, and the Secretary of the Treasury, respectively. The duties of the board shall be: (1) To recommend rules and regulations for the expenditure of moneys allotted to the States under section five of this chapter; (2) to select the institutions and organizations and fix the allotments to each institution under said section five; (3) to recommend to the Secretary of the Treasury, the Secretary of War, and the Secretary of the Navy such general measures as will promote correlation and efficiency in carrying out the purposes of this chapter by their respective departments; and (4) to direct the expenditure of the sum of \$100,000 referred to in the last paragraph of section seven of this chapter. The board shall meet at least quarterly and shall elect annually one of its members as chairman, and shall adopt rules and regulations for the conduct of its business.

Sec. 2. That the Secretary of War and the Secretary of the Navy are hereby authorized and directed to adopt measures for the purpose of assisting the

various States in caring for civilian persons whose detention, isolation, quarantine, or commitment to institutions may be found necessary for the protection of the military and naval forces of the United States against venereal diseases.

Sec. 3. That there is hereby established in the Bureau of the Public Health Service a Division of Venereal Diseases, to be under the charge of a commissioned medical officer of the United States Public Health Service detailed by the Surgeon General of the Public Health Service, which officer while thus serving shall be an Assistant Surgeon General of the Public Health Service, subject to the provisions of law applicable to assistant surgeons general in charge of administrative divisions in the District of Columbia of the Bureau of the Public Health Service. There shall be in such division such assistants, clerks, investigators, and other employees as may be necessary for the performance of its duties and as may be provided for by law.

Sec. 4. That the duties of the Division of Venereal Diseases shall be in accordance with rules and regulations prescribed by the Secretary of the Treasury, (1) to study and investigate the cause, treatment, and prevention of venereal diseases; (2) to cooperate with State boards or departments of health for the prevention and control of such diseases within the States; and (3) to control and prevent the spread of these diseases in interstate traffic: *Provided*, That nothing in this chapter shall be construed as limiting the functions and activities of other departments or bureaus in the prevention, control, and treatment of venereal diseases and in the expenditure of moneys therefor.

Sec. 5. That there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$1,000,000, to be expended under the joint direction of the Secretary of War and the Secretary of the Navy to carry out the provisions of section two of this chapter: *Provided*, That the appropriation herein made shall not be deemed exclusive, but shall be in addition to other appropriations of a more general character which are applicable to the same or similar purposes.

Sec. 6. That there is hereby appropriated, out of any moneys in the Treasury not otherwise appropriated, the sum of \$1,400,000 annually for two fiscal years, beginning with the fiscal year commencing July first, nineteen hundred and eighteen, to be apportioned as follows: The sum of \$1,000,000, which shall be paid to the States for the use of their respective boards or departments of health in the prevention, control, and treatment of venereal diseases; this sum to be allotted to each State, in accordance with the rules and regulations prescribed by the Secretary of the Treasury, in the proportion which its population bears to the population of the continental United States, exclusive of Alaska and the Canal Zone, according to the last preceding United States census, and such allotment to be so conditioned that for each dollar paid to any State, the State shall specifically appropriate or otherwise set aside an equal amount for the prevention, control, and treatment of venereal diseases, except for the fiscal year ending June thirtieth, nineteen hundred and nineteen, for which the allotment of money is not conditioned upon the appropriation or setting aside of money by the State, provided that any State may obtain any part of its allotment for any fiscal year subsequent to June thirtieth, nineteen hundred and nineteen, by specifically appropriating or otherwise setting aside an amount equal to such part of its allotment for the prevention, control, and treatment of venereal diseases; the sum of \$400,000, which shall be paid to such universities, colleges, or other suitable institutions, as in the judgment of the Interdepartmental Social Hygiene Board are qualified for scientific research, for the purpose of discovering, in accordance with rules and regulations prescribed by the Interdepartmental Social Hygiene Board, more effective

medical measures in the prevention and treatment of venereal diseases; the sum of \$300,000, which shall be paid to such universities, colleges, or other suitable institutions or organizations, as in the judgment of the Interdepartmental Social Hygiene Board are qualified for scientific research, for the purpose of discovering and developing more effective educational measures in the prevention of venereal diseases, and for the purpose of sociological and psychological research related thereto.

Sec. 7. That there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$300,000, for the fiscal year ending June thirtieth, nineteen hundred and nineteen, to be apportioned as follows: The sum of \$200,000 to defray the expenses of the establishment and maintenance of the Division of Venereal Diseases in the Bureau of the Public Health Service; and the sum of \$100,000, to be used under the direction of the Interdepartmental Social Hygiene Board, for any purpose for which any of the appropriation made by this chapter are available.

Sec. 8. That the terms "State" and "States" as used in this chapter shall be held to include the District of Columbia.

It will be noticed in reading the above law creating the Interdepartmental Social Hygiene Board and establishing a Division of Venereal Diseases in the Public Health Service that the funds to be allotted to State boards of health were to be expended in accordance with rules and regulations prescribed by the Secretary of the Treasury. These regulations were promulgated by the Secretary of the Treasury on September 4, 1918, and read as follows:

The act provides that \$1,000,000 shall be distributed to the States for the use of their respective boards or departments of health in the prevention, control, and treatment of venereal diseases, this sum to be allotted to each State, in accordance with rules and regulations prescribed by the Secretary of the Treasury, in the proportion which its population bears to the population of the continental United States, exclusive of Alaska and the Canal Zone, according to the last preceding United States census.

State boards or departments of health receiving their respective allotments shall agree to the following cooperative measures under which their appropriation shall be expended:

1. Put into operation through a legislative enactment or a State board of health regulation having the effect of law, regulations in conformity with the suggestions approved by the Surgeons General of the Army, Navy, and United States Public Health Service, for the prevention of venereal diseases. The minimum requirements of these rules are:

(a) Venereal diseases must be reported to the local health authorities, in accordance with State regulations approved by the United States Public Health Service.

(b) Penalty to be imposed upon physicians or others required to report venereal infections for failure to do so.

(c) Cases to be investigated, so far as practicable, to discover and control sources of infection.

(d) The spread of venereal diseases should be declared unlawful.

(e) Provision to be made for control of infected persons that do not cooperate in protecting others from infection.

(f) The travels of venereally infected persons within the State to be controlled by State boards of health by definite regulations that will conform in general to the interstate regulations to be established.

(g) Patients to be given a printed circular of instructions informing them of the necessity of measures to prevent the spread of infection and of the importance of continuing treatment.

2. An officer of the Public Health Service shall be assigned to each State receiving allotments for the general purpose of cooperating with the State health officer in supervising the venereal-control work in the State. This officer to be selected by the State health authorities and to be approved and recommended for appointment by the Surgeon General of the Public Health Service. The salary of this officer will be paid by the State out of the funds made available from the allotment, except a nominal sum of \$10 per month, which will be paid by the United States Public Health Service. In those States where a bureau of venereal diseases has already been established, with a full-time medical officer in charge, the present incumbent may be recommended for appointment by the State health officer, and with the approval of the Surgeon General, United States Public Health Service, he will be appointed as an officer of the Public Health Service. The general plan of work for the State bureau of venereal diseases will be:

(a) Securing reports of venereal infections from physicians and others required to report, in accordance with State laws.

(b) Suppressive measures, including the isolation and treatment in detention hospitals of infected persons who are unable or unwilling to take measures to prevent themselves becoming a menace to others, the establishment of free clinics for the treatment of venereal diseases, and the elimination of conditions favorable to the spread of venereal infections.

(c) Extension of facilities for early diagnosis and treatment through laboratory facilities for exact diagnosis and scientific determination of condition before release as noninfectious, in accordance with the standardized procedure that will be prescribed by the United States Public Health Service.

(d) Educational measures to include informing the general public, as well as infected individuals, in regard to the nature and manner of spread of venereal diseases and the measures that should be taken to combat them.

(e) Cooperation with local civil authorities in their efforts to suppress public and clandestine prostitution. The clinics referred to under (b) will form centers from which the other measures may be conducted by discovering the presence of infections, the securing of data for enforcing the regulations for reporting these diseases, and the institution of educational measures appropriate to particular communities. The immediate reduction in venereal-disease cost resulting from clinic treatment will result in a marked decrease in the prevalence of such diseases in both the military and civil population.

(f) Accurate detailed records must be kept of all the activities of the venereal-disease work. These will include careful records of each case treated, amount of arsphenamine used, final results, and disposition made of patients. Copies of these records must be forwarded to the Surgeon General, United States Public Health Service, as a report at such intervals as they may be requested, and in accordance with instructions regarding the form of report.

3. Local funds that may be available, or that may become available from legislative appropriations or any other source for venereal-disease control, shall be used by the State or city health authorities having jurisdiction for the extension of the work, and such local funds must not be conserved through the expenditure of the funds that are allotted by the Congress through the United States Public Health Service.

4. In extension of the educational measures the State's health authorities and its bureau of venereal diseases shall exert their efforts and influence for

the organization of a State venereal-disease committee that will be unofficial in character, but a valuable cooperative agency for furthering the comprehensive plan for Nation-wide venereal-disease control.

5. The State health authorities shall take such measures as may be found practicable and decided upon in conference between the Public Health Service and State board of health representatives for the purpose of securing such additional legislation as may be required for the development of control of the spread of venereal infections. Action shall be taken to limit or suppress the activities of advertising "specialists" and quacks by prosecuting the under State laws, or such other measures as may be applicable and effective.

6. In expending the sum allotted a State, the rules and regulations to be promulgated by the interdepartmental social hygiene board for the expenditure of the \$1,000,000 civilian quarantine and isolation fund under control of the Secretary of War and Secretary of the Navy shall be given consideration by Public Health Service and State board of health representatives, so that the military necessities of each particular State may receive the consideration due its relative importance, and so that funds from the two sources may be correlated.

7. The State allotment shall be expended along general standard lines for all States and in accordance with an accounting system, to be forwarded by the interdepartmental social hygiene board, approximately as follows:

"(a) For treatment of infected persons in hospitals, clinics, and other institutions, including arsphenamine and other drugs, 50 per cent of the allotment.

"(b) In carrying out educational measures, 20 per cent.

"(c) In carrying out repressive measures, 20 per cent.

"(d) In general administration and other activities of venereal disease control work, 10 per cent.

"(This distribution is provisional and subject to modification after conference and agreement between each State and the United States Public Health Service to best meet the needs of the particular State.)"

8. In carrying out the general Government program the administrative organization of the United States Public Health Service will be available at all times to State organizations in cooperative work, and assistance will be given to States whenever possible through the detail of employees, the securing of arsphenamine, providing literature for the educational measures, and in such other ways as may be found practicable as the work develops.

The Division of Venereal Diseases of the Public Health Service therefore has under its supervision the expenditure of the allotment made to the various States and in addition the funds appropriated by the several States in order to receive Federal aid. It has therefore been possible to develop a national program for venereal disease control whereby similar measures are being carried out in each of the 47 States cooperating with the Public Health Service in this work.

Among the duties placed upon the Division of Venereal Diseases was that of controlling and preventing the spread of these diseases in interstate traffic. In order to meet this duty the Secretary of the Treasury promulgated the following:

## REGULATIONS FOR INTERSTATE TRAVEL OF VENEREALLY INFECTED PERSONS.

[Amendment No. 7 to Interstate Quarantine Regulations, 1916.]

## PUBLIC HEALTH SERVICE.

TREASURY DEPARTMENT,  
OFFICE OF THE SECRETARY,  
Washington, November 19, 1918.

To medical officers of the United States Public Health Service, State and local health authorities, and others concerned:

The following addition is hereby made to the Interstate Quarantine Regulations promulgated by this department January 15, 1916, said addition and regulations being in accordance with the act of Congress approved February 15, 1893.

The following regulation, addition to section 1 and section 28-A, is hereby added to Interstate Quarantine Regulations:

## I.

I. Section 1, line 8. Insert "syphilis, gonorrhea, chancre" after tick fever so that the text will read \* \* \* Rocky Mountain spotted or tick fever, syphilis, gonorrhea, chancre, and epidemic cerebrospinal meningitis; \* \* \*

## II. Introduce section 28-A.

1. Any person, infected with syphilis, gonorrhea, or chancre, who wishes to engage in interstate travel, must first obtain a permit, in writing, from the local health officer under whose jurisdiction he resides. This permit shall state that, in the opinion of the health officer, such travel is not dangerous to the public health.

2. Any person, infected with syphilis, gonorrhea, or chancre, who wishes to change his residence from one State to another must first obtain his release, in writing, from the local health officer. He shall inform the local health officer as to the place where he intends to reside and shall agree, in writing, to report in person to the proper health officer within one week after arrival at his new residence.

It shall be the duty of the health officer who issues the release to promptly notify the health officer under whose jurisdiction the infected person is to enter, of its issue. This release shall contain the name and address of the infected person.

The receiving health officer shall, in turn, report the arrival of the infected person to the health officer who issued his release and notify the State health officer of his State that a person infected with venereal disease has entered his jurisdiction.

3. Any person, infected with syphilis, gonorrhea, or chancre, who wishes to engage in interstate travel or change his residence shall agree to continue treatment, under the direction of a reputable physician, until the health officer shall have certified that he is no longer infectious. A certificate of noninfection shall not be issued until the health officer, or his accredited representative, shall have complied with the State board of health requirements for release of venereally infected persons.

## SUGGESTED FORMS.

## 1. PERMIT TO ENGAGE IN INTERSTATE TRAVEL.

This is to certify that, in my opinion, \_\_\_\_\_ may engage in interstate travel without endangering the public health.

(Name of patient.)  
\_\_\_\_\_  
(Health officer.)  
\_\_\_\_\_  
(Town.) (State.)

## 2. PERMIT TO CHANGE RESIDENCE.

Permission is hereby granted \_\_\_\_\_ to change his residence  
(Name of patient.)  
from \_\_\_\_\_ to \_\_\_\_\_  
(Town.) (State.) (Town.) (State.)  
\_\_\_\_\_  
(Health officer.)  
(Town.) (State.)

## 3. REQUEST FOR CHANGE OF RESIDENCE.

I, \_\_\_\_\_, desire to change my residence from \_\_\_\_\_  
(Town.)  
\_\_\_\_\_, to \_\_\_\_\_, I hereby acknowledge that I am infected  
(State.) (Town.) (State.)  
with \_\_\_\_\_ and agree to report my condition to the local health officer  
at \_\_\_\_\_ within one week after my arrival.

I further agree to continue treatment for \_\_\_\_\_ under the direction  
of a competent physician until I shall have been released by the health officer.  
(Signed) \_\_\_\_\_

## 4. NOTICE OF RELEASE.

\_\_\_\_\_  
(Place.)  
\_\_\_\_\_  
(Date.)  
JOHN DOE,  
Health Officer,  
\_\_\_\_\_  
(Town.)  
\_\_\_\_\_  
(State.)  
This is to inform you that \_\_\_\_\_, who formerly resided at  
\_\_\_\_\_, is infected with \_\_\_\_\_. He has this day secured  
(Town.) (State.)  
his release from this office and declared his intention to change his residence  
to \_\_\_\_\_. He has agreed to report to you within one week after  
(Town.) (State.)  
arrival.

\_\_\_\_\_  
(Health officer.)  
\_\_\_\_\_  
(Place.)  
\_\_\_\_\_  
(Date.)

JOHN DOE,  
Health Officer,  
\_\_\_\_\_  
(Town.)  
\_\_\_\_\_  
(State.)  
This is to inform you that \_\_\_\_\_, who formerly resided at  
\_\_\_\_\_, reported at this office on \_\_\_\_\_ and stated that he is  
(Date.)

infected with \_\_\_\_\_. He {has placed } himself under the care of Doctor  
or  
(will place)  
\_\_\_\_\_ of \_\_\_\_\_  
\_\_\_\_\_  
(Health officer.)  
W. G. McADOO,  
Secretary.

According to the directions of the law, the main function of the Division of Venereal Diseases of the Public Health Service is to cooperate with the State departments of health for the prevention of the spread of these diseases within the State. In carrying out this duty there have been established in 47 States bureaus of venereal-disease control. Each of these State bureaus is carrying out the three-phase program for the control of the venereal diseases agreed upon by the State boards of health and the Public Health Service. The present status of this work may be best illustrated by submitting certain data from the annual report of the Surgeon General for the fiscal year ending June 30, 1920.

During the first year of the work of the Division of Venereal Diseases, ending June 30, 1919, the threefold program for venereal-disease control, including medical, education, and law-enforcement measures, was developed and put into operation with the cooperation of the State boards of health. At the close of the first year 46 States had passed the necessary regulations entitling them to their share of the Chamberlain-Kahn funds and had under way organized campaigns for venereal-disease control.

On June 30, 1919, there were 237 venereal-disease clinics under the joint control of the Public Health Service and the State boards of health. As a result of the regulations requiring the reporting of venereal diseases, 238,502 cases had been reported to the service by State boards of health.

Publicity was given the campaign through newspaper and periodical press, the distribution of pamphlets to the extent of 14,138,348, the posting of 64,892 placards in toilets of railway cars and stations, and through campaigns of lectures, exhibit and motion-picture showings. A total of 11,809 such meetings were reported for the year 1918-19.

During the year 1919-20 the work of venereal-disease control has been carried on extensively through the State boards of health, the work of the division being principally to plan, direct, and advise, and to act as a coordinating center for the States. At the close of the year, June 30, 1920, 46 States have again qualified for Federal funds, this year by raising an amount from State funds equal to their Federal allotment. The District of Columbia, Nevada, and New Mexico alone failed to qualify by providing local funds.

Results of the past year's activities show the greatest development in the medical phases of the work. Reports of 326,117 cases of venereal diseases have been received, of which 172,387 are gonorrhea, 142,869 syphilis, and 10,861 chancroid, a total increase of 36 per cent over the previous year. Doses of arsphenamine, or similar product, administered in 1918-19 totaled 118,055, in 1919-20, 328,382, an increase of 178 per cent. On June 30, 1920, there were 427 clinics

operating under the joint control of the service and the State boards of health. Monthly reports received from 383 of these clinics give a total of 126,131 patients admitted as compared with 59,092 reported by 167 clinics in 1918-19. Of these 126,131 patients, 62,205 had syphilis, 57,561 gonorrhea, and 6,365 chancroid. Patients discharged as noninfectious were 34,215. A total of 1,576,542 treatments were administered, 175,827 Wassermann tests made, and 155,275 examinations given for gonococcus infection.

In addition to the work of the clinics efforts were continued by the States to secure the cooperation of doctors in reporting venereal diseases. The medical and allied colleges were approached again in an effort to secure better instruction for medical students in the pathology of venereal diseases. A special campaign was conducted with the dentists of the country, with the result that 15,307 pledges of cooperation were received.

Intensive work has also been done with nurses through a course in medical social service with special reference to venereal diseases offered by Columbia University under the auspices of the Public Health Service and the American Red Cross.

The Seamen's Service Center in New York City, to which service officials have been detailed, has done valuable work in diagnosing cases of venereal diseases and in referring patients to physicians and clinics for treatment.

Reports of educational activities for the past year show a total of 154,834 requests for pamphlets in addition to 3,161 requests for information from persons infected with venereal diseases received by the service. The Public Health Service has referred 32,519 or 63 per cent of its requests for pamphlets to the State boards of health for compliance as compared with 25 per cent so referred in 1918-19. Owing to lack of funds for printing, the number of venereal-disease pamphlets distributed by the Public Health Service has been greatly reduced, amounting to 2,314,680 for 1920 as compared with 10,120,772 in 1919. Including the distribution of pamphlets made by the States the total for the year 1919-20 is 8,082,792. The State boards of health report the purchase of 5,816,830 pamphlets, 653 exhibits and lantern-slide sets, and 55 motion-picture films. The division has issued 5 new educational pamphlets and has done considerable work on an exhibit for young women and girls which will be published in the fall. An edition of the "Keeping Fit" exhibit for colored young men and boys is also in preparation.

Reports have been received of 12,360 lectures and addresses, 25 conferences, 11,031 exhibit and lantern-slide showings, and 2,157 motion-picture film showings, a total of 25,573 meetings, an increase of 13,764, or 117 per cent over 1918-19.

Special features of the educational activities of the division have been the work with educators, with industrial and commercial establishments, and the "Keeping Fit" campaign, the last carried on largely by the State boards of health.

In addition to the 19 conferences with educators which were held under the auspices of the Public Health Service and the Bureau of Education 48 lectures were given by a service representative to special groups of educators. Questionnaires were sent to over 12,000 high schools of the country. Replies from 6,477 show that of the 2,661 which are giving some kind of sex instruction 324 include instruction in venereal diseases in regular high-school courses. Of the 3,816 schools in which no sex instruction is given 2,262 principals expressed themselves as favoring such instruction, showing the trend of thought among educators to-day.

Over 50,000 industrial establishments were circularized during the year, resulting in hundreds of letters asking for assistance or for information and commenting on the work of the service. Questionnaires were returned by 1,637 of the larger firms having plant medical departments and representing an employed force of 483,155. Of these firms 1,302 expressed a willingness to cooperate with State boards of health, 1,224 have posted placards in toilets, and 679 have bought a total of 186,388 pieces of the industrial program for use among their employees. Many others secured material through the State boards of health or reprinted their own. Conferences were held with the chief railroad surgeons and executives of the 287 roads under Federal control, contracts were made with the officials of the 686 roads under private control, and a campaign thus launched for introducing venereal-disease control measures among railroad employees. Returned questionnaires from 60 of the larger roads show a total of 126,180 employees already reached. Venereal Disease Bulletin No. 24, "War on Venereal Disease to Continue," was sent to 50,000 agents and clients of three large insurance companies, resulting in many letters of inquiry and requests for pamphlets.

The "Keeping Fit" campaign begun in 1919 has been continued throughout the fiscal year 1920. Reports of 3,427 exhibit showings reaching 486,987 boys have been received. In addition to the work with boys, special work has been done with Y. M. C. A. secretaries, a number of lectures and demonstrations having been given to show them how to present the exhibit.

Inasmuch as this has been a year in which most State legislatures have not met, there is little legislation to report. Thirteen States have passed special laws for the control of venereal diseases aside from appropriation bills providing funds to carry on the work. The law-enforcement section has been largely concerned with the

city-grading program and the writing of briefs, abstracts, and digests of laws for cities and States requesting assistance of this kind.

The prominent feature of the year's work has been the grading of 467 cities of the country with a population of 15,000 or over on the basis of measures in effect on or before February 1, 1920, for combating venereal diseases. The division detailed for this work all the regional consultants and others loaned from other branches of the service, a total of 13 officers. Approval of the State health officer was secured in each case, and the State venereal-disease-control officer was invited to accompany the representative making the survey. Each man in the field was given a list of 180 questions to be answered in regard to each city. The questionnaires were sent to the division for rating. Each city was graded on the basis of 1,000 points. This grading has been completed and the printed results will soon be available.

In the cities, the survey has resulted in an aroused interest in the problem of venereal-disease control from the standpoint of its practical application to civic efficiency. Ordinances are being passed and enforcement of laws is becoming more effective; educational measures are being put into operation, clinics established; and in general efforts are being made to develop a higher standard of efficiency in promoting the attack against venereal diseases. The value of the survey to the general program lies in the definiteness which has been given to the work as a result of the data accumulated. A classification of the 359 clinics in the survey has been made possible which, it is hoped, will result in the development of standardized clinics that will best meet the needs of the public. It is in the cities of the country that the Nation-wide program for combating venereal diseases will be tried out, and it is only through surveys such as the one just completed that its practicability and effectiveness can ultimately be determined.

## IX. ORGANIZATION AND OPERATION OF THE SERVICE OF DISINFECTION.

The United States Government does not maintain any distinct and separate force for the exclusive performance of disinfection. Disinfection (fumigation) is one of the chief means relied upon in the operation of the quarantine station to prevent the introduction of quarantinable diseases, and, consequently, the most important function of the quarantine station is that of fumigation or disinfection.

The United States Quarantine Regulations provide specifically as to the methods of fumigation or disinfection to be employed against the introduction of the various quarantinable diseases. For



the prevention of the introduction of plague, disinfection at a United States quarantine station aims at the definite destruction of all rodents on board vessel, and their parasites. Sulphur dioxide and hydrocyanic-acid gas are the agents thought to be best adapted for this purpose. Disinfection for the purpose of destroying bacteria is never performed at the United States quarantine station, nor are such measures carried out for the prevention of the introduction of yellow fever or typhus. In preventing the introduction of yellow fever, fumigation for the destruction of mosquitoes is the only measure employed, aside from control of the human host.

In preventing the introduction of typhus measures that are directed against the destruction of lice on persons and personal effects and bacterioidal measures are deemed of no consequence. In preventing the introduction of cholera the main reliance is placed on bacteriological examination of stools. Fumigation or disinfection are thought to be of small value, although disinfection by heat (steam sterilization) would be carried out in the case of bed clothes or personal effects that are contaminated by cholera discharges, and foodstuffs and water suspected of being contaminated would be sterilized by cooking or otherwise destroyed. Disinfection by steam is generally carried out in respect to any contaminated articles or articles suspected of contamination through contact with smallpox cases.

In recent years hydrocyanic-acid gas is being used more and more in the fumigation of vessels for the destruction of animal and insect life. It has been found by practical demonstration that cyanide gas is infinitely more effective for the destruction of rats on board vessels than is sulphur dioxide, and in the hands of trained employees hydrocyanic-acid gas is not unreasonably dangerous to human life. Cyanide is noninjurious to fabrics, furnishings, and articles of merchandise in general, and the destruction of rats, mosquitoes, fleas, bedbugs, and lice can be accomplished in a very much shorter period of exposure than is accomplished by sulphur dioxide.

The disinfectants authorized by the United States Quarantine Regulations and the proper methods of generating and using these agents are set forth as follows:

#### PHYSICAL DISINFECTANTS.

**BURNING.**—Of unquestioned efficiency, but seldom required.

**BOILING.**—Very efficient and of wide range of applicability. The articles must be wholly immersed for not less than 10 minutes in water actually boiling (100° C.). The addition of 1 per cent of carbonate of soda renders the process applicable to polished steel, cutting instruments, or tools.

**STEAM.**—(a) *Flowing steam (not under pressure)*: Flowing steam when applied under suitable conditions is an efficient disinfecting agent. The exposure must be continued 30 minutes after the temperature has reached 100° C.

(b) *Steam under pressure without vacuum*: Steam under pressure will sterilize, provided that the process is continued 20 minutes after the pressure reaches 15 pounds per square inch. The air must be expelled from the apparatus at the beginning of the process. If impracticable to obtain the designated pressure, a longer exposure will accomplish the same result.

(c) *Steam under pressure with vacuum*: Steam in a special apparatus with vacuum attachment is the best method of applying steam under pressure, the object of the vacuum apparatus being to expel the air and to promote the penetration of the steam. The process is to be continued for 20 minutes after the pressure reaches 10 pounds to the square inch.

#### CHEMICAL SOLUTIONS.

**BICHLORIDE OF MERCURY.**—Bichloride of mercury is a disinfectant of undoubted potency and wide range of applicability. It can not be depended upon to penetrate substances in the presence of albuminous matter. It should be used in solutions of 1 to 1,000. The solubility of bichloride of mercury may be increased by using sea water for the solution, or by adding 2 parts per 1,000 of sodium or ammonium chloride to the water employed.

**CARBOLIC ACID.**—Carbolic acid in the strength of 5 per cent (see paragraph 27) may be substituted for the bichloride of mercury, and should be employed in the disinfection of the cabins and living apartments of ships to obviate injurious action on polished metals, bright work, etc.

**FORMALIN.**—Formalin containing 40 per cent of formaldehyde may be used in a 5 per cent solution as a substitute for bichloride of mercury or carbolic acid, and is useful for the disinfection of surfaces, dejecta, fabrics, and a great variety of objects, owing to its noninjurious character.

#### GASEOUS AGENTS.

**SULPHUR DIOXIDE.**—Sulphur dioxide is efficient, but requires the presence of moisture. It is only a surface disinfectant, and is lacking in penetrating properties. An atmosphere containing 4.5 per cent can be obtained by burning 5 pounds of sulphur per 1,000 cubic feet of space. This amount would require the evaporation or volatilization of about 1 pint of water. In the above proportion it may be used as a disinfectant for some quarantinable diseases, as smallpox, cholera. Its principal use in maritime quarantine is in the destruction of disease-carrying vermin, rats, fleas, lice, mosquitoes, etc. For this it is a very efficient agent, ranking next to hydrocyanic acid gas.

The sulphur may be burned in shallow iron ovens (Dutch ovens) containing not more than 30 pounds of sulphur for each pot, and the pots should stand in vessels of water. Quicker and better results can be obtained from burning the same total amount of sulphur in a number of small shallow ovens (Dutch ovens), 5 to 10 pounds in each, than in a few large ovens. The sulphur ovens should be elevated from the bottom of the compartment to the disinfected in order to obtain the maximum possible percentage of combustion of sulphur. The sulphur should be in a state of fine division, and ignition is best accomplished by alcohol; special care to be taken with this method to prevent damage to cargo of vessel by fire, or the sulphur may be burned in a special furnace, the sulphur dioxide being distributed by a power fan. This method is peculiarly applicable to cargo vessels.

Liquid sulphur dioxide may be used for disinfection in place of sulphur dioxide generated as above, it being borne in mind that this process will require

2 pounds of the liquified gas for each pound of sulphur, as indicated in the above paragraphs.

Sulphur dioxide is especially applicable to the holds of vessel or to freight cars and apartments that may be tightly closed and which do not contain objects injured by the gas. Sulphur dioxide bleaches fabrics or materials dyed with vegetable or aniline dyes. It destroys linen or cotton goods by rotting the fiber through the agency of the acids formed. It injures most metals.

#### FORMALDEHYDE GAS.

FORMALDEHYDE GAS.—Formaldehyde gas is effective if applied by one of the methods given below. Formaldehyde gas has the advantage as a disinfectant that it does not injure fabrics or most colors. It is not poisonous to the higher forms of animal life. It fails to kill vermin, such as rats, mice, roaches, bedbugs, etc. The method is not applicable to the holds of large vessels. Formaldehyde is applicable to the disinfection of rooms, clothing, and fabrics, but should not be depended upon for bedding, upholstered furniture, and the like when deep penetration is required.

#### AGENTS FOR THE DESTRUCTION OF VERMIN, I. E., RATS, FLEAS, LICE, MOSQUITOES, ETC.

##### FUNNEL GASES.

The oxides of carbon are efficient to destroy rats, but do not kill fleas or other insects. They are obtained by burning carbon, coke, or charcoal in special apparatus, and the gas as produced consists of about 5 per cent carbon monoxide, 18 per cent carbon dioxide, and 77 per cent nitrogen. Twenty kilos of carbon, coke, or charcoal are used for every 1,000 meters of space. The gas is allowed to remain in the ship for two hours, and from seven to eight hours are allowed for it to leave. This is about equivalent to 1½ pounds of carbon (coke) to 1,000 cubic feet of air space. As this gas is very fatal to man and gives no warning of its presence, being odorless, a small amount of sulphur dioxide should be added to give warning of its presence. As it does not kill fleas it can not be depended on for complete work where there is evidence of plague among rats on the vessel, as the infected fleas would infect the rats coming aboard after the deratization.

##### PYRETHRUM.

The fumes of burning pyrethrum may be used to destroy mosquitoes when other fumigants are not available or where they can not be used. Four pounds per 1,000 cubic feet of space for two hours' exposure with this amount all, or practically all, of the mosquitoes will be killed, but precautions should be taken to sweep up and destroy any that may have escaped. Pyrethrum stains walls and paper and is the least reliable of the culecides.

##### HYDROCYANIC-ACID GAS.

Hydrocyanic-acid gas is the most penetrating and the most toxic of all fumigants. It is easily and quickly generated, requires very little apparatus, is not destructive to inanimate objects, and in the hands of experienced operators and safeguarded by certain precautionary measures its use is not attended by unusual dangers.

This gas is generated by the mixture of water, sulphuric acid, and a cyanide salt, either potassium or sodium, in the following proportions:

To each ounce of potassium cyanide 1 fluid ounce of commercial sulphuric acid 66B and 2½ fluid ounces of water shall be used.

To each ounce of sodium cyanide 1½ ounces of commercial sulphuric acid 66B and 2 fluid ounces of water shall be used.

All ingredients shall be weighed and mixed immediately prior to each fumigation.

All parts of the vessel shall be placed under fumigation simultaneously except such compartments as may not require fumigation in the opinion of a representative of the United States Public Health Service.

The paraphernalia required includes a tight wooden barrel (preferably of oak) for use in holds; earthenware crocks or jars for smaller compartments, and earthenware jugs or carboys as acid containers.

In the fumigation of superstructures, the acid and water are mixed after all openings have been sealed except the exit for the operator. Finally the operator drops the cyanide into the acid water by hand and hastily leaves the apartment, the door of exit being quickly sealed.

On account of the great danger to human life from hydrocyanic-acid gas, specific arrangements should be made for the disposition of the crew during the fumigation process, especially if one or two compartments of a vessel are to be treated. A written statement must be obtained from the captain or first officer of the vessel that the latter is ready for fumigation, and that every member of the crew has been accounted for, as not being in the vessel or else not exposed to the fumes of the gas. Persons in one compartment have been killed by fumes escaping from another compartment undergoing fumigation. Compartments above deck should have danger labels pasted on doorways after fumigation has commenced.

When a vessel is fumigated with cyanide gas, no one shall be permitted to enter the various compartments of the ship until entry to such space is declared safe by the medical officer in charge of the fumigation.

Subsequent to opening hatches, companionways, and ports, not less than 15 minutes shall elapse before any one shall enter the superstructure, such as staterooms, cabins, saloon, or forecabin, and not less than one hour before entering the holds. This is the minimum, and the time will be prolonged according to the discretion of the officer in charge.

If artificial means for ventilation, such as blower or fan, are not available, windsails shipped into place should be utilized for aeration of hold. All hatch covering shall be removed.

Before declaring it safe to enter holds, a captive animal (guinea pig, rat, cat, etc.) shall be lowered and exposed to the aerial content of such compartments, and the effects produced, if any, shall be a guide in estimating the amount of gas present in dangerous quantity.

After measures have been taken to free compartments of cyanide fumes, and the application of test by captive animal indicates sufficient dissipation of the gas to make entering the compartments a safe procedure, they should be entered in all parts by one of the fumigators or by the officer himself. This shall be done as a final step before the officer declares the vessel safe to be entered by the personnel connected with the vessel.

Decision as to safety of entering compartments shall be made by the officer in charge of the fumigation and on board the vessel concerned; but during the interval between the sealing of compartments undergoing fumigation and the time appointed for determining the safety of entering the officer may designate a trustworthy employee or employees to attend to the opening up of com-

partments, the supervising of installation of blower or wind sail, and the prevention of any persons entering compartments before permission of the officer in charge.

#### FUMIGATION STANDARDS.

The strength of cyanide gas and the duration of exposure varies with the object sought. The service standards in this respect are as follows:

(a) For destruction of mosquitoes: One-half ounce of sodium cyanide per thousand cubic feet of space, exposure one-half hour.

(b) For destruction of fleas: Two and one-half ounces of sodium cyanide per thousand cubic feet of space, exposure one-half hour. This is of academic interest only, as in practice ships are not fumigated for flea destruction only, but always with the idea of rat destruction as well as flea destruction.

(c) For destruction of rodents (rats and mice): Five ounces of sodium cyanide per thousand cubic feet of space, exposure for two hours.

(d) For destruction of lice: Ten ounces of sodium cyanide per thousand cubic feet of space, exposure for two hours.

(e) For destruction of bedbugs: Five ounces of sodium cyanide per thousand cubic feet of space, exposure for one hour.

The above standards apply to empty holds and superstructures, except storerooms that have a large quantity of stores. In cargo-laden holds or in well-packed storerooms the length of exposure shall be doubled.

The standard for sulphur dioxide as to strength and exposure is as follows:

(a) For mosquito destruction: Two pounds of sulphur per thousand cubic feet of space, exposure for one hour.

(b) For destruction of lice: Four pounds of sulphur per thousand cubic feet of space, exposure for six hours.

(c) For destruction of rats (fleas): Three pounds of sulphur per thousand cubic feet of space, exposure for six hours.

The above standard is for superstructure, partially filled storerooms, and empty holds. For cargo-laden holds and well-filled storerooms, or in compartments that are packed with materials, the time of exposure should be doubled.

#### GENERAL DETAILS IN THE FUMIGATION OF VESSELS.

For computing the air space of a vessel, a registered ton should be estimated as containing 100 cubic feet. A vessel of 1,000 net tonnage would, therefore, contain 100,000 cubic feet of air space in the holds alone, since net tonnage indicates the cargo-carrying capacity, in contradistinction to the gross tonnage, which indicates the ship's total cubic capacity.

The cubic capacity of crews' quarters, cabins, engine room, poop deck, or other above-deck compartments have to be computed for each individual compartment.

The various details in connection with the fumigation of vessels are of almost equal importance as the nature of the fumigant used, and the observation of these details to a large extent determines the effectiveness or the inefficiency of the fumigation. All possible care should be observed by the quarantine officer to see that dead space in the vessel is opened up and all practical measures should be taken to aid in the diffusion of the fumigating gas, and this is especially important when sulphur dioxide is used. All dunnage and loose material from the holds of a vessel that is not cargo laden should be arranged in compact order and placed on elevated platforms to avoid rat harborage. If sulphur dioxide is generated in a furnace and led into the vessel, it should be introduced at the lowest point and the hatches left open for a short while so as to

permit of the escape of air and hasten diffusion of the sulphur fumes. Pipe casing should be opened up and from one end of the vessel to the other there should be a certain number of timber boards removed so as to permit of penetration of the gas into the bilges. Any planked-over space between the outer and the inner sheathing of a vessel should also be freely opened, and wherever there is dead space it should be opened up so that there will be free circulation of the gas. Careful attention should be given to lifeboats, which are often infested by rats, which resort to these places for water. Preferably, lifeboats should be cleaned and flooded by water prior to fumigation. Very close attention should be given to the poop deck, which is a space frequently containing a heterogeneous collection of litter and is generally badly rat infested. In general, the engine room and fireroom do not harbor rats, but in the treatment of a plague-infested vessel they should be fumigated.

#### X. MOVEMENT OF POPULATION AND RATE OF MORTALITY DURING THE LAST FIVE-YEAR PERIOD.

Preliminary figures of the United States Bureau of the Census showed that the population of continental United States January 1, 1920, was about 105,683,000. The census of 1910 indicated a population of 91,972,266, and that of 1900 a population of 75,994,575. The Census Bureau says:

This is an increase since 1910 of 13,710,842, or 14.9 per cent, as compared with an increase from 1900 to 1910 of 15,977,691, or 21 per cent. The large falling off in the rate of growth for the country as a whole, as shown by these figures, is due mainly to an almost complete cessation of immigration for more than five years preceding the taking of the census in January last, and in some degree also to an epidemic of influenza, and to the casualties resulting from the World War. \* \* \*

From all available data, it may be roughly estimated that the annual excess of births over deaths throughout the United States is approximately 1 per cent. This rate compounded would indicate an increase of approximately 10.5 per cent during the decade. Thus the nearly 92,000,000 persons present in the United States in 1910 might be expected to increase to about 101,700,000 in 1920. In addition, the excess of immigration over emigration during the decade was approximately 3,733,000. Since the bulk of these foreign-born persons came to the country during the first four years of the decade, it may be roughly estimated that the increase due to excess of births over deaths in their families was about 10 per cent. Thus the population of the country may be assumed to have been augmented by about 4,100,000 during the decade through excess of immigration over emigration. \* \* \*

The figures of the present census also show that the trend of population from the country to the city has become greatly accentuated since 1910 and that, for the first time in the country's history, more than half the entire population is now living in urban territory as defined by the Census Bureau. That is to say, of the 105,083,108 persons enumerated in the Fourteenth Census, preliminary tabulations show that 54,816,200, or 51.9 per cent, are living in incorporated places of 2,500 inhabitants or more and 50,866,890, or 48.1 per cent, in rural territory. At the census of 1910 the corresponding percentages were 46.3 and 53.7, respectively, showing a loss of 5.6 per cent in the proportion for the population living in rural territory. To show more clearly the change in the

proportion of the population living in rural territory now as compared with 10 years ago, the rural population can be divided into two classes, namely, 5,864,196, or 9.3 per cent of the total population, living in incorporated places of less than 2,500 inhabitants and 41,922,703, or 38.8 per cent of the total population, living in what may be called purely country districts. At the census of 1910, the population living in incorporated places of less than 2,500 inhabitants formed 8.8 per cent, while the population living in purely country districts formed 44.8 per cent of the total population. \* \* \*

The percentages of increase shown for the several States vary greatly, due in part to the causes which have been noted as affecting the increase in the population of the country as a whole but also in part to the abnormal internal movement of population required to meet the excessive demands of the war work in certain sections. For three States—Mississippi, Nevada, and Vermont—there have been small decreases in population, the largest decrease being for Nevada, 5.5 per cent.

### XI. WATER SUPPLY AND SEWERAGE SERVICE—EXTENT.

The application of the principle of municipal ownership of water supply and sewerage service has now become so general in the United States as to be practically coextensive with the nation, and the delegation is glad to report that frequent examination of water and its purification by filtration, or chemicals, or both, is also practically universal.

### XII. ROAD PAVEMENTS—THEIR RELATION TO SANITATION.

Road-paving materials or road surfacings have a bearing on sanitation from the standpoint of the ease by which they may be cleaned of the dust produced by the traffic passing over them, of the waste materials produced by horse-drawn traffic, and from other accumulations of debris produced by their use.

The following table shows the various road pavements or surfacings arraigned in the order of their ease of cleaning. These various classes of road surfaces have also been compared to an ideal pavement with reference to ease in cleaning, the figure 10 having been assigned to an ideal pavement and a relative value assumed for the other classes of pavement referred to the ideal as a basis:

Ideal pavement	10
Sheet asphalt	10
Bituminous surface	9
Bituminous concrete	9
Bituminous macadam	9
Wood block	9
Brick on concrete	9
Concrete	9
Stone block on concrete	8
Macadam	7
Gravel	3
Earth	1

(1) The ideal pavement, in addition to the purely sanitary aspect of being easily cleaned, should also be noiseless, efficacious for road users, should easily be made dustless, provide a good foothold for horses, be nonslippery for all classes of vehicles in all kinds of weather, yield neither dust nor mud, have a low tractive resistance, low first cost, low annual cost of maintenance, and as esthetic and impervious surface.

(2) Sheet asphalt has the smoothest surface of any of the types of pavement and therefore is the easiest of any to clean. In addition the pavement is impervious, offers very little resistance to traction, and outside of stone block and brick is one of the most durable road surfaces. When dirty and when there is sufficient water to moisten the dirt the pavement becomes particularly slippery. Asphalt-block pavements present a surface very similar to sheet asphalt, with the same characteristics, except that it is not as slippery.

(3) Bituminous surfaces. Where a superficial coat of bituminous material is applied to a gravel or macadam road surface the road is more durable and better able to withstand traffic. A coating of tar will prevent dust in exposed locations. Treatment with a coat of heavy asphaltic material will be less dusty than with the tar coating. The foothold afforded and the tractive resistance depend upon the nature and amount of the bituminous material used. Both types of surface are easily cleaned and are impervious.

(4) and (5) Bituminous concrete and bituminous macadam pavements are more durable than macadam roads with bituminous surfaces. In other respects they are similar to bituminous roads.

(6) Wood-block pavements afford a smooth surface, with little resistance, to traffic and are easily cleaned. They are slippery under certain conditions, are not so durable, and unless treated with a preservative are subject to rapid decay. This type of pavement is practically noiseless.

(7) Brick pavements on a concrete base, if correctly built, are smoother than stone-block pavements and are more easily cleaned. They are, however, not so durable as the stone-block pavement. Brick pavements offer a good foothold, with very little resistance to traffic.

(8) Concrete pavements give a good foothold, with very little tractive resistance, are somewhat impervious, and produce a fine dust from abrasion and if not removed becomes very slippery in wet weather. If cleaned there is no objection from the standpoint of dust. Their value is greatly increased by the application of a bituminous surface.

(9) Stone-block pavements on a concrete base are suitable for the heaviest traffic. Thorough sweeping and watering are required to prevent dust. This type of pavement is not so easily cleaned as

other types which have a smoother surface. The pavement is noisy, slippery in wet weather, and after the blocks have become rounded from wear.

(10) Macadam roads, if built properly, withstand exceedingly well horse-drawn traffic, but not high-speed motor traffic. Unless the surface is treated they are dusty, and unless cleaned, which is rather difficult, become muddy in wet weather. Macadam roads are not noisy and offer a good foothold for horses.

(11) Gravel roads are not so durable as broken stone roads. They are dusty in dry weather unless treated with a surfacing. Repeated sweeping fails to remove all of the fine loose material and dust can not be eliminated.

(12) Earth roads in some sections where other material is not available are the most economical. They are inexpensive and easily maintained. Like gravel roads, unless treated with a dust palliative, they are exceedingly dusty, and, like gravel roads, cleaning fails to remove all of the finer loose material, so that dust is always present.

The increased use of concrete, asphalt, and bituminous materials during the past years and their relation to sanitation may be summed up in the statement that while raising to a higher standard the details of road construction these materials have facilitated the cleaning of the pavements and decreased the dust and dirt produced from their use after construction.

### XIII. ORGANIZATION AND OPERATION OF THE SERVICE OF MARITIME SANITATION.

This governmental function is exclusively performed at the quarantine stations at ports of entry in the United States. The quarantine system of the United States was formerly composed of disconnected units, the individual stations being operated by the respective States or cities in whose jurisdiction the stations were located. Between 1880 and 1890 there were some three or four national quarantine stations, the remainder being under State or local control, each one operating under a different set of regulations and the whole system without any coordination. In 1893 Congress enacted a law having for its objective the consolidation and unification of the various quarantine units.

It is, of course, apparent that, under the system of local control, the temptation would be very great for one port to lower its sanitary barrier as compared to a competing port in order to attract maritime traffic. The quarantine act of 1893 provided that the Surgeon General of the Public Health Service should formulate quarantine regulations which should serve as a minimum at all ports and should in

no wise operate discriminately against any port. Local authorities maintained the privilege of providing additional safeguards, but it is not permissible for any local government to adopt regulations less stringent than those provided by the national quarantine law. Since 1893 various States and cities have transferred control of the various quarantine stations to the Federal Government, so that at present all quarantine stations at maritime ports are operated by the Public Health Service, with the sole exception of the station at the port of New York, which will be transferred on January 1, 1921, to the Public Health Service, thus completing the national quarantine system.

The quarantine service of the United States is directed by the Surgeon General of the Public Health Service through the Quarantine Division of the Public Health Bureau. The organization, however, is largely decentralized. The officers of the Public Health Service in charge of the various stations administer their respective stations with the exercise of considerable discretion, subject at all times, however, to the limitations of the United States Quarantine Regulations, the general administrative regulations of the service, and specific instructions from the bureau in individual cases. All operating expenses of the national quarantine stations are provided for in appropriations made by Congress, and cover pay of personnel, maintenance of station constructions and floating equipment, disinfecting apparatus, and various miscellaneous expenditures. Under the Public Health Service there are operated some 62 quarantine stations on the mainland of the United States, and in the Philippine Islands, Hawaiian Islands, Porto Rico, and the Virgin Islands 26 stations are administered by officers of the Public Health Service. Of the total, some 45 stations include facilities for the disinfection of vessels and personnel, for the detention of those that require such treatment, and also floating equipment for the boarding and treatment of vessels. The remainder have a small equipment, and are principally maintained for inspection purposes only, any infected vessel being remanded to the nearest station equipped with proper facilities for disinfection and detention. At a fully equipped quarantine station there are provisions for the boarding and inspection of vessels, apparatus for the mechanical cleansing of ships, equipment for disinfection by steam, sulphur, or formaldehyde, or by various disinfecting solutions, a clinical laboratory, hospital for contagious cases, detention barracks for suspects or contacts, bathing facilities, a sufficient supply of safe water, a proper system for the disposal of sewage, with housing facilities for the operating personnel.

The United States quarantine system contemplates, in addition to the safeguards provided at the domestic port, that there should also be carried out at the foreign port of departure certain sanitary precautions by the master of the vessel, as a prerequisite to the issuance of a United States bill of health. Thus, a vessel departing from a plague infected port must, before securing American consular papers, be fumigated for the destruction of rats. If from a cholera infected port, the departing personnel must either be examined to determine freedom from cholera vibrios or, otherwise, undergo detention, before embarking for a period of five days, covering the incubative stage. Similar precautionary measures are provided against ships and personnel destined to the United States, when from a port infected with yellow fever, typhus, or smallpox. The requirements, however, are mainly precautionary, not contemplated to be wholly protective. The vaccination of personnel from a smallpox infected port, delousing measures from a typhus infected port, examination for cholera carriers from a cholera infected port, the deratization of a vessel from a plague infected port or for fumigation for the destruction of mosquitoes from a yellow fever infected port, all serve, however, to materially expedite commerce through the prevention of cases of disease en voyage and materially expedite the passage of such vessels through quarantine at ports of entry in the United States.

The United States Quarantine Regulations require that all vessels entering a port of the United States from a foreign port shall be subject to an inspection and must, in making customs entry, present a certificate signed by the quarantine officer to the effect that the vessel has, in all respects, complied with the quarantine regulations and that, in the opinion of the quarantine officer, the vessel will not convey any quarantinable disease. If, upon inspection, there be found to be any case of plague, yellow fever, cholera, typhus, or smallpox, the vessel and the personnel are given appropriate treatment before being released. The Revised Quarantine Regulations of the United States contemplate no detention of personnel of vessels on which there is carried a case of bubonic plague other than that which is incident to the fumigation of the vessel for the destruction of rats and fleas. The arbitrary detention of seven days, which was formerly imposed against the crew and passengers, has been discontinued in connection with measures for preventing the introduction of bubonic plague.

With respect to the prevention of typhus, detention for the period of incubation is deemed necessary, subsequent to the disinfection for the destruction of vermin, of the personnel and their effects.

As to yellow fever, fumigation for the destruction of mosquitoes and the detention of exposed personnel throughout the period of incubation are the essential features contained in the United States Quarantine Regulations for preventing the introduction of this disease. A vessel from a yellow fever infected port, if it has been fumigated prior to departure for the destruction of mosquitoes or has not lain in such proximity to the shore as to render it liable to the access of mosquitoes, if arriving at a port of the United States, without a case of yellow fever on board, is subject to detention to complete six days from port of departure, but, if arriving subsequent to that period and without sickness, is permitted entry without detention. The Revised Quarantine Regulations of the United States, 1920, do not contain the provision of the previous regulations, providing for fumigation and detention of six days against a vessel from a yellow fever port that has been en voyage longer than 12 days. It is recognized theoretically that on such a vessel there may have been mild cases, and that stegomyia bred on board may have become infected, but, in view of the elimination of sailing vessels and the curtailment of breeding facilities for mosquitoes on steam vessels, the provisions for detention of a vessel from a yellow fever port that has been out longer than 12 days were discontinued as being of only remote probability. The Revised Quarantine Regulations also contemplate, in respect to cholera, that a bacteriological examination shall replace, wherever practicable, the requirement of an arbitrary period of detention of five days. Such passengers and crew as are found, upon bacteriological examination, not to be harboring the cholera vibrio, are released without further detention. On the other hand, convalescent carriers or immune carriers are retained until the disappearance of the vibrio from stools. At one of the quarantine stations of the United States, during the European epidemic of cholera in 1911, a convalescent carrier was detained for 54 days before the disappearance of the vibrio. In contrast to this, however, many immigrants, who had been in contact with cholera cases, were permitted entry within 48 hours, because bacteriological examination demonstrated them to be free of cholera vibrio. In respect to smallpox, evidence of recent successful vaccination permits the release of those who have been in contact with this disease, but those who have been exposed to smallpox, and not protected by recent successful vaccination, are held in detention for a period of 14 days.

During the fiscal year 1920 officers of the Public Health Service at the various national quarantine stations inspected 23,139 vessels, with a total of 1,720,379 passengers and crew; 4,974 vessels were disinfected or fumigated. At various quarantine stations vessels with cases of typhus, yellow fever, and smallpox were given treatment.

During the fiscal year 1920 no cases of cholera appeared on vessels bound to the United States.

With the cessation of hostilities in Europe and the resumption of maritime commerce the danger of the introduction of epidemic disease into the United States became apparent because of the spread of typhus, cholera, smallpox, and plague and the resumption of immigration to the United States in ever-increasing numbers. In anticipation of this condition of affairs, however, medical officers of the United States Public Health Service were assigned to American consulates abroad to supervise the application of preventive measures at European ports. At present Public Health Service officers are stationed at practically all the important ports of continental Europe. All verminous persons coming from typhus-infected areas are given appropriate treatment and detention, if necessary, before embarkation for a port of the United States. Immigrants are required to be vaccinated if from a smallpox-infected area, and vessels from a plague-infected port are required to be fumigated while empty prior to clearance for a port of the United States.

Because of the insidious manner in which the spread of plague is accomplished, it is being realized more and more that the only measure that seems to promise the successful exclusion of plague from seaports is the systematic fumigation of vessels for the destruction of rats and the maintenance of ships in as nearly as possible rat-free condition. It is well known that plague may exist for a considerable period of time among rats before its appearance in human beings. Rodent plague was discovered in 1912 in at least three cities in Porto Rico, wherein through the application of eradication measures no human cases ever appeared. Rodent plague has also been demonstrated, through trapping and examination of rats, to exist in localities across the Mississippi River from New Orleans, although no human case ever developed in that territory. It is also to be noted that rodent plague existed in New Orleans for at least two years subsequent to the fall of 1914, although during this period no human plague occurred. It is no difficult matter for rodents, hidden away in articles of freight, to be transported from an infected warehouse to some port not known to be infected and the infection thus implanted in some other city or country not previously infected, which in turn might well become the distributing center of infection while the disease is spreading amongst the rats and before it appears in the human population. Because of these factors the United States quarantine regulations require a periodical fumigation of vessels for the destruction of rats, regardless of previous ports at which the vessel has called. A vessel so fumigated is fur-

nished with a certificate by a Public Health Service officer, as follows:

CERTIFICATE OF FUMIGATION.

[This certificate when given shall be considered part of the bill of health.]

UNITED STATES CONSULATE,

Port of \_\_\_\_\_, 192\_\_.

I hereby certify that I have this day personally supervised the fumigation of the steamship \_\_\_\_\_, about to clear for the port of \_\_\_\_\_, and that the vessel and all things on board requiring it have been fumigated.

	Cubic capacity.	Pounds sulphur.	Ounces cyanide.	
Holds.....	1			Date.....
	2			Duration of exposure.....
	3			Evidence of rats before fumigation.....
	4			Rats after fumigation, living, dead.....
	5			Inspection made by.....
Engine-room and shaft alley.....				Opened by.....
Bunkers.....				Damage or other protection to rats; how treated prior to fumigation.....
Forepeak.....				
Forecastle.....				
Steerage.....				
Diningsaloon (first cabin).....				
Pantry (first cabin).....				
Galley.....				
Second cabin.....				
Second cabin pantry.....				
Provision storeroom.....				
Living quarters.....				
Staterooms.....				
Smoking room.....				
Total.....				

On the reverse side make a report of all compartments which were not fumigated, why they were not, and give treatment. Also report any other pertinent information.

Appropriate modification of the quarantine procedure in force at maritime ports is also applicable to border quarantine stations on the Canadian and the Mexican frontiers.

Medical examination of immigrants, although a function correlated to quarantine, is separate and distinct from the latter. The control and restriction of immigration to the United States is placed within the jurisdiction of the Bureau of Immigration of the Department of Labor. The United States immigration law provides, however, that all immigrants arriving at ports of the United States shall be subject to inspection by officers of the Public Health Service, and, in carrying out this provision of the law, the activities of the Public Health Service and the Bureau of Immigration are coordinated.

In the fiscal year 1920, officers of the Public Health Service made medical examinations of 762,127 immigrants. Medical certificates were issued against 25,109 aliens, 5,216 being afflicted with some loathsome contagious or dangerous contagious disease (chiefly trachoma, gonorrhea, or syphilis), 734 with tuberculosis or mental conditions, and 14,810 with physical conditions affecting their ability to earn a living.

#### XIV. WORK OF THE HEALTH COMMISSIONS OF EACH ONE OF THE AMERICAN REPUBLICS.

##### THE UNITED STATES PUBLIC HEALTH SERVICE.

The United States Public Health Service (which was established 122 years ago) is maintained as a part of the Treasury Department for the purpose of safeguarding the health of the Nation through the enforcement of domestic and maritime quarantine laws, and by continual research into all fields for the betterment of public sanitation and hygiene in both the rural districts and the populous industrial centers, so that any community or industrial enterprise confronted with problems relating to the health and welfare of the people may get expert advice and help from the Government whenever needed. Records are kept and the information compiled for reference, the experience of one community thus being available for the benefit of all, through Federal cooperation with the State, county, and city health boards.

The work of the Bureau of the Public Health Service is carried on under the following divisional heads: Personnel and Accounts; Foreign and Insular (maritime) Quarantine; Domestic (interstate) Quarantine; Hospitals and Relief; Scientific Research, Sanitary Reports and Statistics; Venereal Diseases; General Inspection Service; Section of Public Health Education; Chief Clerk's office.

The Division of Personnel and Accounts has charge of the entire personnel of the service, and also the financial and accounting section. The work in this division has increased tenfold during the past two years on account of the extension of activities, especially that relating to the examination and treatment of beneficiaries of the Bureau of War Risk Insurance.

The Division of Foreign Quarantine has supervision over the administration of the national quarantine stations and the medical officers engaged in the examination of arriving aliens. On the mainland of the United States, including Alaska, and in the insular possessions, including the Philippines, Hawaiian Islands, Porto Rico, and the Virgin Islands, the Public Health Service operates approxi-

mately 90 quarantine stations to prevent the introduction of epidemic diseases, such as cholera, yellow fever, typhus, bubonic plague, leprosy, and smallpox. In addition to the operation of the quarantine stations, medical officers of the Public Health Service are assigned to the American consulates in various foreign countries, in order to enforce precautionary measures of a sanitary nature against vessels, crews, and passengers departing for the United States.

During the fiscal year 1920, medical officers at quarantine stations inspected 14,171 vessels at domestic stations, and at foreign and insular ports, 5,989. At foreign and insular ports, 838 vessels were fumigated or disinfected, and at national quarantine stations, 2,492 were fumigated or disinfected.

The measures taken at quarantine stations are provided in the United States Quarantine Regulations, but are necessarily influenced by sanitary conditions in the ports from which vessels hail, and information as to such conditions is received by the Public Health Service from consular reports transmitted through the State Department and by the individual quarantine officer by means of the bill of health issued by the American consular official. The United States immigration law provides that all aliens entering the country shall be subject to medical inspection by officers of the Public Health Service, and in conformity with this provision of the law during the fiscal year of 1920 there were examined 1,537,527 aliens, of which number 25,109 were certified to as having either a mental or physical defect or some disease affecting their right to enter the United States.

The functions of the Interstate Quarantine Division are the suppression of epidemics and the prevention of the spread of communicable disease from one State to the other. The activities of the division during the past year included the administration of the interstate quarantine regulations for the prevention of the spread of disease; plague-suppressive measures in New Orleans, Galveston, San Francisco, Beaumont, and Pensacola, including rat surveys in Mobile, Key West, Savannah, Charleston, and other ports; the control of water supplies used by interstate carriers; and the carrying out of bureau policies for the prevention of epidemics by building up and improving divisions of communicable diseases and sanitary engineering in the State health departments.

The Hospitals and Relief Division is established for the purpose of furnishing hospital and medical relief to the various classes of beneficiaries entitled to treatment under laws enacted by Congress. The largest of these classes are seamen of the American merchant marine, ex-service men and women who incurred disability during the late war, and injured employees entitled to treatment under the



United States Employees' Compensation Commission. During the fiscal year ended June 30, 1920, the service operated 60 hospitals, and a very large number of other relief stations where medical and hospital treatment was furnished. The Public Health Service is also under a reciprocal agreement with the Canadian Government whereby discharged Canadian soldiers resident in the United States receive medical attention and American soldiers receive like treatment while resident in the Dominion of Canada.

The Scientific Research Division conducts scientific field and laboratory studies of diseases of man and other public health problems. Among the diseases studied are anthrax, amoebiasis, botulism, deer-fly fever, hookworm, influenza, leprosy, malaria, meningitis, pellagra, pneumonia, plague, polomyelitis, syphilis, and related diseases, trachoma, tuberculosis, and typhoid fever. Studies and investigations are also made in matters relating to child hygiene, industrial hygiene, industrial wastes, public health organization and administration, sewage disposal, pollution of streams, and excreta disposal. In addition to these studies the division has charge of the following lines of work: Demonstration work in rural sanitation, treatment of cases of trachoma in hospital and field clinics for the purpose of suppressing that disease, supervision of the manufacture and sale of viruses, serums, toxins, and analogous products, including arspenamine and neoarphenamine, in interstate traffic, and medical and surgical care of beneficiaries of the United States Employees' Compensation Commission, the last named activity being carried on in cooperation with the Hospitals and Relief Division.

The Division of Sanitary Reports and Statistics collects and publishes information regarding the prevalence and geographical distribution of diseases dangerous to the public health in the United States and foreign countries. This information is essential to enable Federal, State, and local health authorities to take necessary steps to prevent the spread of these diseases or their introduction into the United States. Laws, regulations, ordinances, and court decisions pertaining to public health are compiled, digested, and published. The division issues the weekly Public Health Reports and reprints from and supplements to the reports. Articles of interest to public-health workers are published, and when these are of general interest they are issued in the form of reprints for economical distribution.

The Division of Venereal Diseases was established in 1918 for the study and prevention of venereal diseases. Through cooperation with the States under the terms of the Chamberlain-Kahn Act it has conducted an active campaign. Forty-six States have accepted allotments from the Chamberlain-Kahn fund, and about 400 free clinics have been established throughout the country. In addition to medi-

cal measures, educational work is steadily progressing through the medium of publications, card exhibits, stereopticon slides, and motion pictures. Assistance and cooperation are also afforded the States and municipalities in the preparation of laws, ordinances, and regulations for the correction of conditions which favor the spread of venereal diseases.

A general inspection service was created to meet the need for prompt, accurate, and positive information from unbiased source to the Surgeon General regarding all service activities and to enable the immediate elimination of any inefficiency in any part of the service.

In order to extend and better coordinate the work of public-health education there was organized in the Public Health Bureau a Section of Public Health Education in April, 1919. This section aims to constitute a national center or clearing house on the subject of public-health education. It cooperates with State and local health associations and others in disseminating information on public health through the preparation and publication of health pamphlets, the issuance of press bulletins, the maintenance of stereopticon loan library, and other recognized vehicles for the spread of such information. On application to the section interested persons may secure a large number of helpful bulletins dealing with all phases of public health.

The chief clerk's office has charge of all administrative work in the bureau not specifically included within the scope of the other divisions. This comprehends principally supervision of the clerical force of the bureau, office quarters, supplies and equipment, mails and files, bureau library, and printing of service publications.

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